



Education and Culture DG

Lifelong Learning Programme

A Nutrition Guide for Early Childhood Active Stakeholders

NutGECs

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PHOTOGRAPHS

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Partner Organisations

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Preface

The aim of this project is to prepare a nutrition guidebook for early childhood active stakeholders that are applicable across Europe and Turkey. The developed nutrition guidebook is the result of two-year collaboration between academics from different professions (nutritionists, home economists, paediatricians, education scientists, health psychologists) across five countries.

Chapter 1: Introduction

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This guidebook focuses on nutrition education in early childhood, importance of diet in children's health, current situation, differences and problems in participating countries, teacher attitude towards nutrition education in kindergarten, best practices for nutrition in early childhood in participating countries and nutrition activities for teachers to reach parents and children in the setting kindergarten from the age of three until the age of primary school entry. The education process during which the physical, psycho-motor, mental and language development of children takes place, which plays a significant role in their future life and which is given by families and institutions from the day the child is born until he/she starts primary education, is called the early childhood period (Milli Eğitim Bakanlığı, 2011).



A healthy diet is essential for a healthy growth and development. Furthermore, adequate nutrition prevents a variety of nutrition-related health problems such as under/malnutrition, or obesity, anaemia, cognitive disabilities, caries, and other chronic diseases in later life. When a child is not developing appropriate, good nutrition becomes an integral component of early intervention, particularly when a medical problem or inhibition prevents the child from getting essential nutrients and calories (Contento et al. 1995). In the human life, the early childhood phase is considered as one of the most important periods due to the physical and cognitive development. The well being of children depends mainly on their families' solidarity and support. Children need to grow up in a nurturing and secure family that can ensure their development, protection, survival and participation in family and social life (Aral, Kandır and Can Yaşar, 2000; UNICEF, 2003).

During the early childhood years, parents retain the primary responsibility for the development of their child's food preferences through exposure, modelling, accessibility, and availability (Sweitzer et al. 2011). Parents are the primary role models for food choice and eating styles, although children are impressionable and easily influenced by the food preferences of peers, teachers, and caregivers. Childcare centres become more important as major health and nutrition source for children and parents (U.S National Center For Education in Maternal and Child Health, 1998). Early years in life are essential and sustainable for establishing healthy eating habits and a positive attitude towards healthy food. Healthy eating behaviours provide children with long term health benefits and

optimize their growth and development (Contento 2011; Beaver, Brewster, Neaum and Tallack, 2004). The early childhood institution where young children spend much of their time is an effective setting for nutrition education. Therefore, early childhood educational services play an important role in creating a culture of healthy eating and helping children to develop healthy behaviours related to food choices (Scaglioni, Salvioni and Galimberti, 2008; Plum 1997). The early childhood institution provides staff with an ideal opportunity to positively influence children's eating habits through role modelling and to teach children about healthy food and drinks in a safe, supportive environment. Staffs also have numerous opportunities to promote, inform and guide parents to make healthy food choices (Trippree and Morphett 2010).

Nutrition Education in Early Childhood

Nutrition education is a key constituent of lifelong healthy eating and should start from the early stages of life (Perez-Rodrigo and Aranceta, 2001). Early childhood is an excellent time to teach children about eating healthy. Reaching young children with fun and entertaining nutrition education programs can promote better eating habits. Preschool children are an excellent audience due to their readiness to learn and potential for change. Their natural curiosity in food and their bodies can lead to the formation of lifelong food habits, preferences, and attitudes (Levy and Cooper 1999). The early childhood institution is an important portal for behaviourally based nutrition interventions that promote healthful dietary behaviours among young children (Kaphingst and Story, 2009; Gupta, Shuman, Taveras, Kulldorf and Finkelstein, 2005). Teaching young children to make nutritious food choices is important because of the connections between nutrition and learning, the fact that children are starting to make their own choices, and indications that diets of preschool children may not be optimal for lifelong application. The amount of time many children spend in early childhood institution presents a challenge for early what practical methods can be used to increase the effectiveness of nutrition education for young children? The following methods of delivering nutrition education are likely to be useful. Use food-based activities, create developmentally appropriate learning experiences, apply activity- and play-based teaching methods, focus on behaviours, encourage self-regulation, involve parents and families (Contento, 2011).

The role of stakeholders is important in terms of the sustainability and effectiveness of nutrition education. Stakeholders are individuals, groups and organizations who are interested in or affected by the issue under consideration, or have an influence on intervention implementation (Hughes and Margetts, 2011). The core stakeholders in nutrition and nutrition education during early childhood education can be listed as representatives of the preschool administrators, teachers and staffs, prospective teachers, parents, other children, people in academia/researchers, health professionals, caterers, food industry workers, local retailers, and policy makers in education or mass media.

To identify the main stakeholders a stakeholder analysis was performed in each country according to Hughes and Margetts (2011) during the initial project phase. Considering these results early childhood teachers were identified as goal players because of their central role. They are a role model for children, a person of trust for children and parents,

are often responsible for daily nutrition and nutrition education in kindergarten and are in contact to the caterer. Thus, this nutrition guidebook provides scientific based information and methodologies for kindergarten teachers.

All the above mentioned has led us to the following aims for our project:

- Active cooperation and transfer of knowledge between the European partners in the project.
- Increase of quality and usage of vocational education focusing on typical techniques for vocational education.
- Create cooperation with related sectors to intensify mutual learning.
- Improve awareness of nutrition in early childhood to increase quality of life.
- Contribute to forming and improving awareness among stakeholders of the importance of nutrition education during the early childhood period.
- Preparation of a guidebook offering descriptions and solutions for sustainable nutrition and nutrition education, which can be used by all stakeholders of children in early childhood.

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Definition of Socio-Economically Disadvantaged Groups

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According to the EU-SILC people are defined as socio-economically disadvantaged, who have a disposable income of less than 60% of the national median. Especially, people with minor employment, women, children, and residents older than 65 years have a higher risk of poverty than the average (Özdemir and Ward, 2010).

Reference

Özdemir, E. and Ward, T. Research Note 7/2010. The persistent risk of poverty. European Commission, Social Situation Observatory – Income distribution and living conditions, Brussels, 2010:3. Retrieved 20.03.2012 from http://www.socialsituation.eu/research-notes/RN07_2010_Persistent%20poverty.pdf

Chapter 2: Importance of Diet in Children's Health

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Introduction

Correct eating habits and a physical active life style are of great importance for maintaining health and quality of life at any age. The risk for chronic diseases has increased by physical inactivity and an unhealthy diet. Because unhealthy diet in childhood and adolescence has negative implications on later health, nutrition education at an early age is essential. The efforts concerning healthy eating habits should involve not only the families, but also the early child education system from the very first beginning in kindergarten and preschool. The basic idea is to improve education - as far as nutrition is concerned - of all persons who are involved in child education - in this case in kindergarten and preschool. In early childhood, from the beginning of child education in kindergarten and preschool, it is important to show great carefulness and awareness in the issue of healthy nutrition. To achieve this, it is aimed to create collaboration with all related sectors (Freytag-Leyer and Berger, 2011). As important as professional education on food and nutritional components itself behavioural development in relation to healthy eating pattern has to be considered in children's education. So it is necessary to know the psychological facts on how children - as well as adults - can be influenced in their nutritional habits. Considering these aspects, it can be conducted how food for children has to be preferred, prepared, and presented to fulfil the special needs for healthy child nutrition.

Role of Diet in Children's Health: Effects of Over-Eating and Poor Eating Habits

Classification of Body Weight in Children

WHO Child Growth Standards were developed using data collected in the WHO Multicentre Growth Reference Study (July 1997–December 2003), a population-based study that took place in the cities of Davis, California, USA; Muscat, Oman; Oslo, Norway; and Pelotas, Brazil; and in selected affluent neighbourhoods of Accra, Ghana and South Delhi, India. For the indicator BMI-for-age 26 985 number of observations were used in the construction of the WHO child growth standards (WHO, 2006).

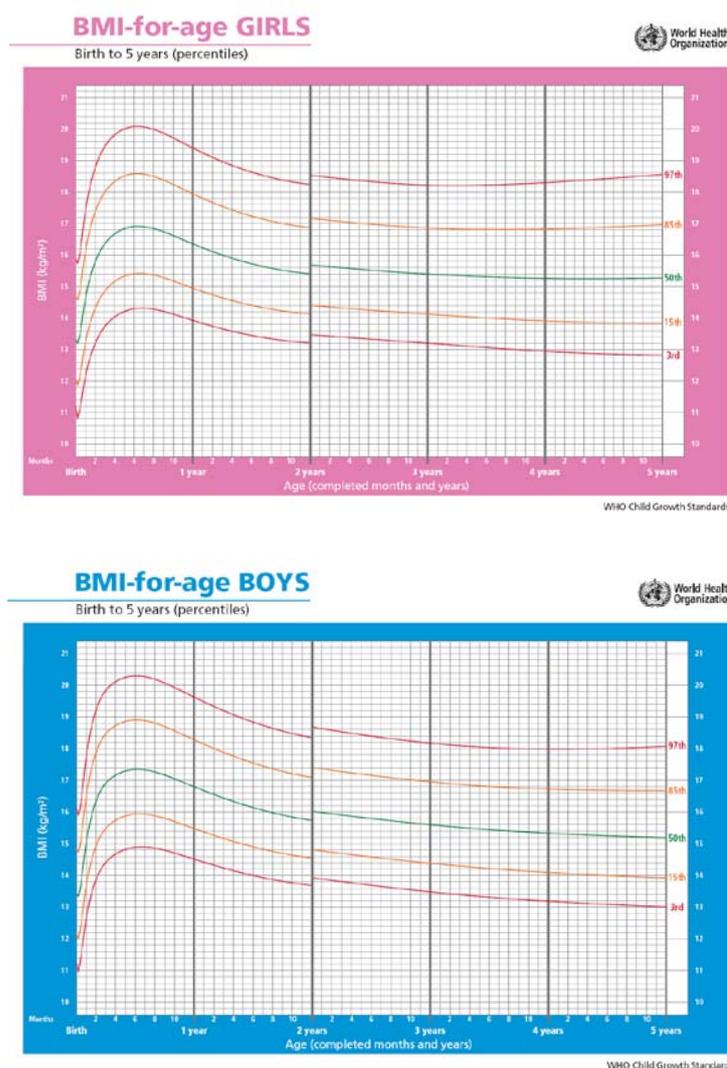


Figure 1: WHO BMI Percentiles (WHO 2006)

Both the Childhood Group of the International Obesity Task Force (IOTF) and the European Childhood Obesity Group (ECOG) recommend to use the body mass index ($BMI = \text{weight in kilograms}/\text{height in meter}^2$) to evaluate overweight and obesity in children and adolescent. Contrary to the fixed cut off points used to define overweight and obesity in adults, due to physiological alterations of fat mass, in children and adolescents age and sex specific developmental changes in BMI need to be addressed. Measurements of height and weight from 17 different regional studies including 17147 boys and 17275 girls aged 0 to 18 years were used to calculate a BMI reference data set (Kromeyer-Hauschild, 2001). The 4th and 10th BMI percentiles and the 90th and 97th BMI percentiles as calculated in this reference population are proposed as cut-off points for the definition of strong underweight, normal, overweight and obesity in German children and adolescents.

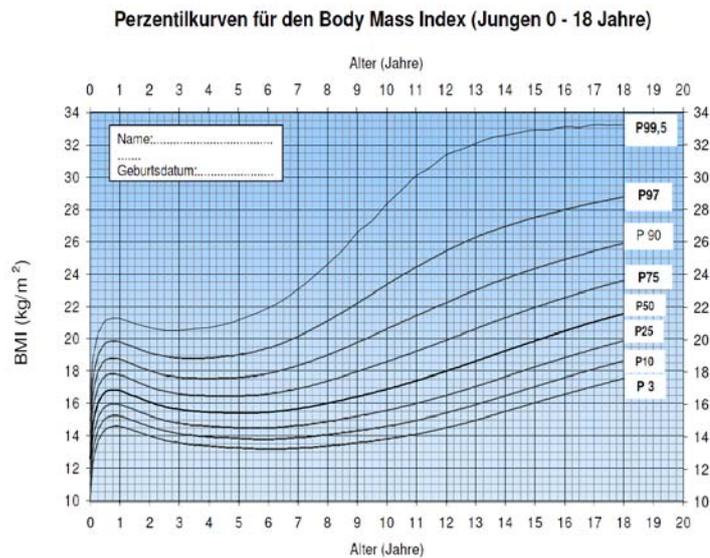
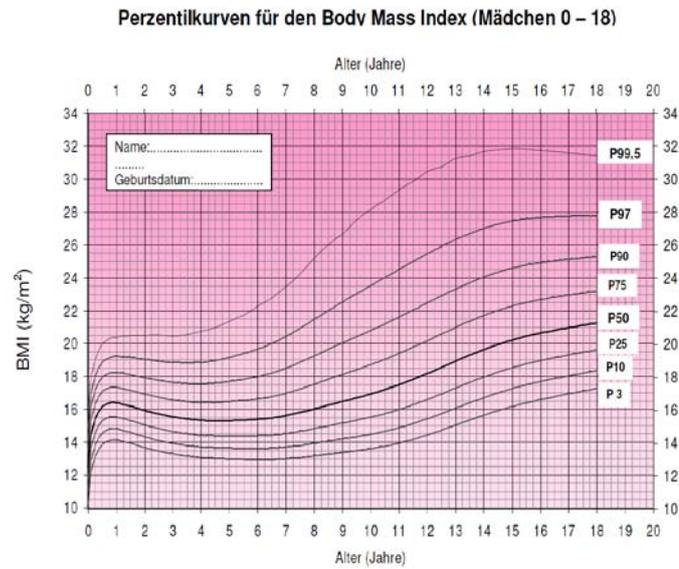


Figure 2: Kromeyer-Hauschild BMI Percentiles (Kromeyer-Hauschild, 2001)

Since 1999 the need for a common reference was emphasized. But still, several international references are available. The IOTF references established for 2 – 18 year-olds are internationally based and, because they are built to pass through adult cut-offs which are linked with mortality rates, they are less arbitrary than other cut-offs. They are also less geographically and temporally dependent than some other references. WHO standards and references display data from birth and references for various anthropometric measurements. Ideally, a common definition of childhood obesity should be adopted, but in the absence of a widely shared consensus, prevalence should be reported using several references. Thus, in prevalence studies, IOTF and WHO definitions should be used. Besides, additional national references can also be used (Rolland Cachera, 2011).

Epidemiologic Data on Body Weight in Children

43 billion children younger than 5 years are overweight, 92 billion are at risk to get overweight. In 2020 an increase up to 60 billion children is expected (De Onis et al. 2010).

On the same time 16.2% of children younger than 5 years are underweight and causes 52.5% of all death in children (WHO, 2011).

Table 1: Prevalence of underweight, normal weight, overweight, and obesity in children (%)

Country	n	Under-weight	Normal-weight	Over-weight	Obesity	Reference
Austria (3-6 years) ¹	441	6	79.0	10.0	5.0	Elmadfa et al., 2003
Austria (3-6 years) ¹	183	5.4	79.2	10.9	4.4	Rust et al., 2012
Germany ¹	3875	5.2	85.7	6.3	2.9	Kurth and Schaffrath-Rosario, 2007; Hölling et al., 2012
Latvia ²		10.5	68.0	13.5	8.0	Sabiedrības veselības aģentūra, 2008
Latvia ²		10.8	66.5	12.6	10.1	Sabiedrības veselības aģentūra, 2010
Romania (3-6 years) ³	39		38.5	33.3	28.2	Coșoveanu, 2011
Romania (6-10 years) ²	166		34.4	24.7	40.9	Coșoveanu, 2011
Turkey ²	1201	7.6	74.5	12.4	5.5	TOÇBI, 2011
¹ Kromeyer-Hauschild, 2001						
² WHO, 2006						
³ CDC nomograms, 2000						
Underweight, as well as overweight and obesity in children aged 3-6 years are responsible for most of the noncommunicable diseases.						

Relationship Between Diet and NCDs in Children

Definition Noncommunicable Diseases

The World Health Organization states that a relatively small number of diseases is responsible for large parts of the disease burden in the European Region. Those diseases are subsumed under the general term "noncommunicable diseases" (NCDs) with diabetes mellitus, cardiovascular disease, cancer, chronic respiratory diseases and mental disorders as the most important ones (WHO, 2012). These above mentioned common non communicable diseases are responsible for 86% of all deaths and 77% of disease burden in the European region. Regarding the six WHO regions, it is Europe that is most affected by noncommunicable diseases. According to recent WHO reports more and more people in the EU come down with noncommunicable diseases (NCDs). Each year two of three deaths can be attributed to NCDs and a third of those people are younger than 60 years (Lancet 2011).

Risk Factors for NCDs

In most European countries, five of the seven most important risk factors for noncommunicable diseases are linked with diet and exercises. These include: high blood pressure, high blood cholesterol, overweight, low fruit and vegetable consumption and physical inactivity. An important risk factor, where prevention should be focussed on especially in childhood, is obesity. Overweight children become more often overweight adults. Obese children develop more often diabetes and cardiovascular diseases at a younger age than children who are non-overweight or obese. Diabetes mellitus and cardiovascular diseases are associated with a higher risk of premature death and disability (WHO, 2012).

According to reports by the WHO in 2010, approximately 43 million children were overweight or obese, of which 35 million are from developed countries. In addition, 92 million children were at risk of becoming overweight (De Onis et al., 2010).

Effects of Nutritional Components on NCDs Risk

The best prevention against NCDs is to reduce the risk factors like obesity, high cholesterol levels and high blood-pressure. According to WHO, 40% of deaths from NCDs per year are attributed to the consumption of foods high in saturated fats and manufactured trans fatty acids as well as high in salt and sugar (WHO 2004). Especially a high intake of either saturated fatty acids, trans fatty acids, salt or sugar, especially sweetened beverages, play a critical role in the development of NCDs (Lancet, 2011).

Protein Intake

In western countries, the amount of consumed protein is 3-4 times larger than the recommended level for an adequate supply for pre-school and school-age children. A relationship between high protein consumption in pre-school age and obesity during school-age was found. This important but still preliminary observation needs to be confirmed by further research (Barilla Centre For Food Nutrition, 2010). If proteins - especially those of animal origin - are eaten in excess, they can promote weight gain to the point of obesity and - as a consequence - increase the risk of developing diseases such as breast, uterine and colon cancer (Must and Lipman, 1999).

Fat Intake: Especially Intake of Saturated Fatty Acids and Trans Fatty Acids

The consumption of fat represents not only a source of energy and essential fatty acids, but also provides optimal absorption of lipoid-soluble vitamins (A, D, E, K). On the one hand, it is pointed out that fats and cholesterol play an important role in child growth, especially in terms of cerebral development, and therefore should not be reduced in the diet below certain limits: specifically for small children (2-3 years of age), calories from fats should be 30-35% of total energy intake, while from the age of 4 years on it should be 25-35% of total energy intake. One reason for limiting the amount of fats in the diet of pre-school children is a possible association between lipid levels and the onset of obesity and cardiovascular problems during adolescence and adulthood. Because of the high palatability and energy density of fats, a high consumption can impact an increased

calorie intake and can cause the deposit of lipids in adipose tissue, with an increase in overall adiposity and at least in obesity. However, there is no causal relationship been demonstrated lipid levels and obesity - apart from the increased caloric intake, the main existing evidence regarding a relationship between consumption of fats by small children and subsequent cardiovascular problems seem to be indirect and often extrapolated from studies conducted on adults and children suffering from hypercholesterolemia. Studies have shown that the amount and level of fats consumed in the nourishment during childhood determine the levels of lipoproteins in blood serum just as it does in adults. Therefore it is important to give the same nutritional recommendations for children as for adults (Barilla Centre for Food Nutrition, 2010).

Through effects on blood pressure, blood lipids, thrombosis, arterial (endothelial) function, arrhythmogenesis and inflammation, the amount and quality of dietary fat intake influences the risk of cardiovascular diseases, such as coronary heart disease and stroke. A direct association has been observed between the intake of saturated fatty acids and the risk for cardiovascular diseases. Also a very low intake (less than 1% of daily energy intake) of trans fatty acids (hydrogenated oils and fats) should be provided to prevent cardiovascular diseases (WHO/ FAO, 2003).

Especially in childhood dairy products are often the most significant sources of fat intake. The Austrian Nutrition Report 2008 shows that dairy products in children even contribute to about 20% of the total fat intake. Therefore, the high proportion of saturated fatty acids in dairy products should be considered. Low-fat milk products should be preferred combined with a sufficient supply of high quality vegetable oils. Through its special fatty acid composition with a high proportion of short-chain fatty acids dairy products may also have positive effects on health. Short-chain fatty acids are easily absorbed and utilized. This is a health-promoting effect - for example, by reducing the risk of colon cancer by butyric acid or improving blood lipid profile by propionic acid (Elmadfa et al., 2008). Thus, it is important to look for both, the quantity of fat intake as well as the quality- low-fat dairy products should be preferred. Further negative associated components are trans fatty acids. They are naturally present in milk, milk products or ruminant meat (cows, sheep) or artificially created during industrial hydrogenation of vegetable oils and fish oils. Several studies show that trans fatty acids have negative effects on cholesterol levels and thus increase the risk of cardiovascular diseases. Links between trans fatty acid intake and cancer, diabetes mellitus, cell membrane changes, and an increase in inflammatory reactions have also been found (Elmadfa et al., 2008).

Salt Intake

An important point in the prevention of NCDs is the reduction of salt intake. The majority of people consume too much salt, which may increase blood pressure and thus leads to one of the main risk factors for stroke and heart disease. Studies have shown that high blood pressure in all ages occurs mainly in countries with a high sodium intake, while in countries where the average salt consumption is at a lower level even an age-related rise in blood pressure and hypertension was not observed. But,

the hypertensive effect of salt also depends on other risk factors for hypertension, e.g. obesity. A reduction in salt intake leads to a reduction in blood pressure and thus to a significant reduction in the risk of cardiovascular disease (Dorner et al, 2011).

Therefore, it is especially important to reduce salt intake in children's nutrition. A high salt intake in childhood may not only lead to an early familiarization with a high intake of salt, but also to an increase in blood pressure. A strong effort to reduce salt consumption is necessary to prevent with high blood pressure attendant secondary diseases (Mensink et al., 2009).

Sugar Intake, Especially Intake of Sweetened Beverages

Because sugar is a primary source of energy without contributing the body in any other way, the WHO explains that a diet excessively rich in sugary foods and drinks during pre-school and school-age years is not acceptable - taking aside the obvious effects on health in general (Barilla Centre for Food Nutrition, 2010).

An important factor for obesity and thus, for the development of NCDs is the excessive intake of sugar. From an early age on, a higher energy intake is accomplished by the consumption of sweets and sweetened beverages. These foods contain a high energy content, but little protein, complex carbohydrates, vitamins, minerals and trace elements (Kavey, 2010).

In their research, the American Dietetic Association has shown that children with a high BMI more often become obese adults and have a greater risk to come down with hyperinsulinemia / type 2 diabetes, hypertension, and dyslipidemia during childhood and adulthood. Regarding the pathogenesis of obesity, the central factor is the imbalance between consumed and expended energy (Kavey, 2010). A longitudinal study with white girls aged 5 years carried out in the USA observed an association between the consumption of sugar-sweetened beverages at the age of 5 years with a higher percentage of body fat, higher waist circumference and BMI-for-age percentile from ages 5 to 15 years (Fiorito et al, 2009).

Energy, absorbed in liquid form by sugar-sweetened drinks, will lead to inadequate saturation, to an incomplete compensatory reduction in subsequent energy intake and thus to obesity. Several American studies have shown a strong correlation between the presence of obesity and these risk factors in childhood with an accelerated onset of atherosclerosis, early cardiovascular disease and premature death (Kavey, 2010).

A diet rich in (added) sugars influences the energy intake from other important sources, reducing the consumption of micronutrients, minerals and vitamins which are necessary to a growing body. It should be ensured that food with high sugar content is replaced by food rich in starches, fiber and micronutrients - for example, fruit and vegetables (Barilla Centre for Food Nutrition, 2010).

Effects of Fruit and Vegetable Intake on NCDs Risk

From preventive medical point of view the consumption of vegetables and other plant foods should already be increased in early childhood. Vegetables are a major supplier of vitamins, minerals, fibre and phytochemicals, and are low in energy with appropriate preparation. Especially in childhood critical intake of folate and fiber can often be improved by a higher consumption of vegetables (Mensink et al., 2009).

The report by the World Cancer Research Fund from 2007 clearly shows that it is mainly plant food among the diets that protect against cancer. Being aware of this, it is important to know that increased consumption of various plant foods prevent certain cancers. Especially vegetable foods with a low energy density and a high nutrient density are in the focus, having high fiber content and in addition a low content of starch. It can be assumed that not starchy vegetables and fruit protect against cancer and it is also probably - due to their low energy density - which these foods protect against weight gain (WCRF Report, 2007).

While in the past it has been accepted as true that an adequate fruit and vegetable consumption is considerable potential in reducing cancer risk, this statement has been corrected: For certain types of cancer such as mouth/ throat/ larynx/ oesophagus/ stomach and lung cancer a reduction of disease risk can be assumed, but not to the total cancer risk (WCRF Report, 2007; Hung et al., 2004; Takachi et al, 2008).

In contrast to these results, a correlation between an adequate intake of fruit and vegetables and positive effects on the cardiovascular system and the risk of stroke is undisputed. Due to the low energy density of most fruit and vegetables intake may have beneficial effects on body weight. Since there is a strong correlation between body weight and the incidence of diabetes mellitus type 2, it is assumed that there will be a probably indirect influence of fruit and vegetable consumption on cancer risk (Elmadfa et al., 2008). From this information it can be deduced, that it is not sufficient only eating some more fruit or vegetables sometimes, but to increase the quantity of fruit and vegetable in nourishment by changing dietary habits.

Growth and Behavioural Development in Pre-School Children

How and on what a person is nourishing in life and how the individual taste preference once has been developed, is initially controlled by genetic preferences and patterns inside the mother's womb and later on strongly formed by social and cultural conditions. Factors such as the 'mere exposure effect' or the 'specific sensory saturation' play an important role (Ellrott, 2007). The following figure shows the main factors influencing the development of eating habits in a child's life. It is clear that the development of eating behaviour can be influenced from the very early infancy on.

Factors influencing the development of eating behaviour in children and adolescence

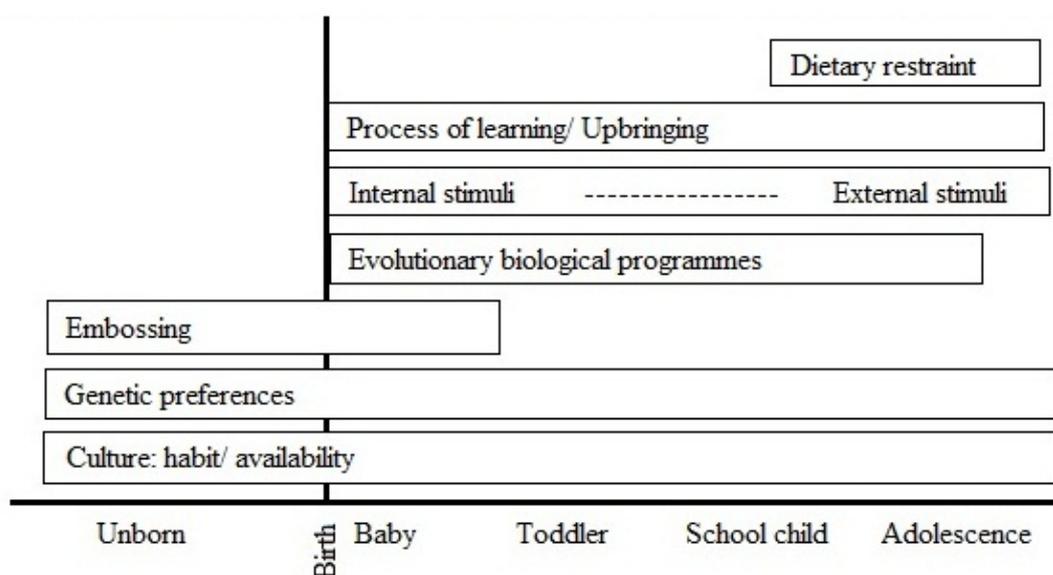


Figure 3: Factors influencing the development of eating behaviour in children and adolescence (modified (translation) of original figure according to Ellrott, 2007).

Genetic Preference for Sweet

The only taste preference that does not need to be learnt is 'sweet'. All over the world, newborn babies like the taste of sweet and reject sour, strong salty and bitter (Ellrott, 2007). This preference for sweets can be seen as a safety signal. The sweet taste seems to be the only flavour that is genetically valued as positive, because there is no food available in the world that tastes sweet and is poisonous at the same time. In 1976, the psychologist Paul Rozin described the sweet preference of infants as a 'security flavour of evolution.' Preferring sweet food, initially evolutionarily related, is enhanced by the sweet taste of breast milk infants experience from the first days of their lives on. This innate preference for sweet food does not certainly impact the intensity of how sweet something has to be to taste good for the child. The level of the sugar concentration depends on learning experience (Pudel, 2002).

Already in 1979, the facial expression of new-born babies was investigated at various taste sensations (Steiner, 1979). It turned out that it seems to be an innate preference for sweet and salty flavours, while bitter and sour flavours have been avoided. Such preferences let us hypothesize that sweet food reflects a source of energy, while bitterness predicts toxicity (Benton, 2004).

Mere Exposure Effect

The term 'mere exposure effect' was coined in 1968 by the psychologist Robert Zajonc. With this term, he describes the fact that the attitude of a person to situations, people or things can be positively influenced by multiple performances (Zajonc, 1968). This means that a food is preferred by a child if the child has already made positive experiences with this kind of food. Children do not choose food because they like it, but because they remember that they already liked them before. This habit-forming experience is of great importance because in addition to the taste impression a safety signal is assigned - a food that was well tolerated even once, can be recognized by taste (Pudel, 2002).

Specific Sensory Satiety

The counterpart to the 'mere exposure effect' is the 'sensory-specific satiety'. This can be understood as a refusing of food as a result of an often repeated certain taste. This refusing blocks the frequency of eating food because of the 'mere exposure effects' and thus leads to more variety in food intake and enables a balanced nutrient intake. This saturation effect may begin with a delay, possibly after several weeks of exposure. This leads naturally to the consumption of a wide range of different foods. In most cases, parents unconsciously manipulate this process by prohibitions of specific sensory saturation - with the result to achieve the very opposite effect, so that certain taste preferences are established (Pudel, 2002).

Neophobia and 'Picky and Fussy' Eating

Neophobia and 'picky' or 'fussy' eating are two different manifestations of the rejection of certain foods. Both describe a rejecting eating behaviour of children towards special food products. While in the case of neophobia - the fear of new things - the child refuses to eat new, unknown food, the phenomenon 'picky' or 'fussy eating' shows a dislike of either mostly familiar but also unknown food. As a result, the food intake is limited to a few specific food products. Essentially, the neophobia in food is an integral part or a subset of the picky / fussy eating (Dovey et al., 2007). In their review about the question whether children reject or accept fruit and vegetables, Dovey et al. describe the effects of neophobia or picky / fussy eating. Different variables such as age, personality, gender, social influences and interest to try unfamiliar foods, affect the development or the expression of neophobia or picky / fussy eating. Some factors, such as eating under pressure, personality factors, parental eating patterns as well as social influences, have similar effects on both the magnitude and the duration expressing these behaviours. By behavioural interventions, neophobia and picky / fussy eating can be weakened and the acceptance of fruit and vegetables can be enforced (Dovey et al., 2007). In spite of some divergent opinions, the majority of relevant scientists think that the peak level of neophobia appears at the age of 2-6 years and then is slowly declining (Figure 4). This can be attributed to the fact that many new flavour impressions occur in a child's life. Growing older, the child will experience a larger variety of foods, so that the neophobia

decreases, as fewer things are new for the kids and they have developed more likes and dislikes (Dovey et al., 2007).

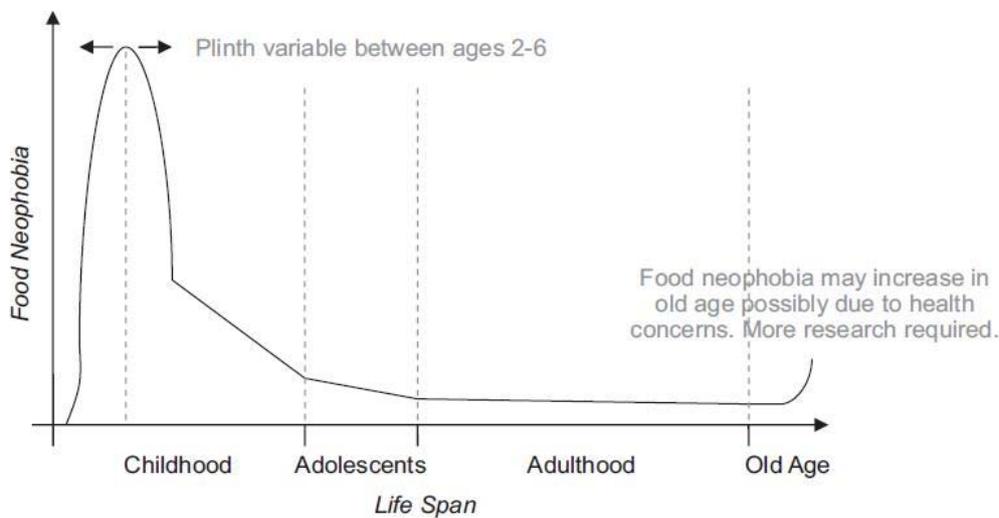


Figure 4: A possible model for the life levels of food neophobia in humans (Dovey et al., 2007)

Klazine van der Horst showed in 2012 that picky eating and the pleasure of eating highly correlated with each other. The study confirms the central role of consumption as well as the relationship between pressure and picky eating while eating. Pressure and restrictions not only disrupt the child's food-intake-regulating mechanism, but also strengthens a problematic relationship with food (Van Der Horst, 2012).

Van der Horst's conclusion is that the enjoyment can be enhanced through practical experiences with food - for example by having fun during cooking. Experiencing cooking promotes getting to know food. Thus, infants learn much on the diversity of taste in early childhood and picky eating behaviour and neophobia will be pushed back. The repeated consumption of new food without negative physiological consequences or positive feelings like physiological saturation leads to an increased acceptance of foods and thus to learning preferences (Van Der Horst, 2012).

The Influence of Role Models

Parents play an important role in the development of a child's eating habits. The younger a child is, the less his or her eating habits are established and strengthened. Parents and caregivers must be encouraged to learn more about healthy food and to act as a role model. Food should never be used to reward children or to calm them (Gibson et al, 2012).

If a child gets sweets as a reward, it will always associate sweets with positive experiences, which can lead to a preference and to an excessive consumption of sweets (Pudel, 2002).

On the other side, children can be encouraged to try new or non-tasting foods by repeated offers in a positive social environment. At least five to ten of such taste experiences may be necessary to improve the taste or the acceptance reliably. Rewards can be quite an effective strategy to bring children close to healthier foods, but rewards must not consist of extremely preferred food (Gibson et al, 2012). A more secure approach rewarding a healthy diet is giving away coupons or something else which can be redeemed later.

It is possible to produce a much longer lasting impact on preferences - for example for vegetables - by verbal praise. It is also helpful to prepare food such as fruits and vegetables as attractive as possible—perhaps through child-friendly presentation, decoration or by sweetening (Gibson et al., 2012).

Adults should avoid excessive force or conversely restrict foodstuffs. It is probable that such approaches generate negative social and emotional experiences, which impedes the acceptance of foods. Instead, parents or caregivers can exert a positive control by limiting the availability or the exposure of unhealthy foods and manipulate portion sizes of healthy foods, especially at the beginning of a meal. Small children are encouraged to eat healthier if social conditions are changed. This can be reinforced by media (including books and movies) and should contain the widest variety of healthy foods (Gibson et al, 2012).

Socio-Economic Impacts

In contrast to the innate primary needs such as hunger and saturation, the secondary needs for eating are acquired in a long-standing socio-cultural process. Children learn about different foods at certain meals on certain occasions, in certain combinations and so on. The internal stimuli - such as hunger and satiety - are losing their importance and will be replaced by external stimuli. For example, eating at fixed times triggers the 'eat when you're hungry'. Also the amount is no longer chosen according to how hungry one is, but portion size or packaging (Ellrott, 2007).

Cultural Conditions

The cultural environment in which a child grows up has a major impact on the learning process of the child. The food culture in which kids grow up is of great impact with respect to individual taste development (Ellrott, 2007).

Food Advertising and Mere Exposure Effect

Another very important factor for food choice is food advertisement. Children come face to face with food marketing by TV, newspapers, billboards and even in the supermarket.

This must be seen critically in these days when under our current conditions no direct negative consequence occurs after consuming a new food. A weakening of the importance of the 'mere exposure effect' on food choice may be the consequence. On the other hand, advertising increases substantially the subject of curiosity and therefore may lead into a positive process (Ellrott, 2007).

Time Associated Impacts Affecting Nutrition Education

Parents and teachers often explain children that eating certain foods may have adverse effects in the future - not considering that for nutrition education there are very inconvenient time relationships between food intake and possible consequences. Younger children cannot understand phrases like 'do not eat so much chocolate, you will get fat!', because there will be a vast amount of time between the act (in this example, consuming chocolate) and consistency (here obesity). The chocolate will not lead to an increased body weight directly after sweets consumption. The enjoyment of the taste impression, however, occurs immediately (Ellrott, 2007).

The Problematic Health Argument

Often words as 'healthy' and 'unhealthy' are used to convince children of eating or not eating certain foods. However, especially in young children 'healthy' has negative connotations due to the fact that foods entitled as 'healthy' are not the preferred one. In addition, there may be negative effects in two aspects: on the one hand these foods prescribed by authorities such as parents or educators are not very appetizing, on the other hand an 'involuntary supply' may have a touch of paternalism. This plays a part in contributing to negative sentiments towards healthy foods. Phrases like 'This tastes delicious, you really have to try!' are much more promising to awaken the desire for healthy foods.

To cover the nutrient requirements food variety is very important. In the education of children, it is not necessarily a question of what is eaten, but rather how much or how often something is eaten (Ellrott, 2007).

Summary

In summary, the following clues to encourage healthy eating habits can be given:

- Look to eat in a pleasant atmosphere.
- Siblings, peers, parents and educators are important role models.
- Children should get used as soon as possible to the natural flavours of traditional food.
- An initial rejection of new food items is normal. Repeated tasting is required for food acceptance of originally rejected tastes.
- A wide range of food with low energy density should be preferred.
- A prohibition of certain food - such as candies - increases its attractiveness. In contrary, the constraint to eat certain foods (e.g. vegetables) will lead to an increased rejection of these foods.
- Children should be allowed to decide how much they eat - it depends on their feeling of hunger and satiety.
- Foods with a high energy density (e.g. sweets) should not be used as a reward (Benton, 2004).

Dietary Guidelines for Children



The Second WHO European Action Plan of 2007 contains objectives and targets for reducing the burden of health through nutrition-related NCDs and obesity in children and adolescents. The main goals are to reduce the daily intake of energy from saturated fatty acids fewer than 10% of daily energy intake (E%) and from trans fatty acids under 1E%. The intake of sugar should not exceed 10% of daily energy intake;

the intake of salt should be less than 5 grams per day. In addition, the consumption of fruit and vegetables should be more than 400 g per day (WHO, 2007).

The risk for chronic diseases is increased by physical inactivity and an unhealthy diet. Unhealthy nutrition - especially in childhood and adolescence - has implications on health in the future. Therefore, intentions for changing eating habits should be realized in early childhood to prevent non communicable diseases at an early stage of development.

Optimized Mixed Diet® as General Recommendation for Child Nutrition Concerning Children Aged 3 to 6

In 1993, the Research Institute of Child Nutrition in Dortmund, Germany developed a special diet concept for children named “Optimized Mixed Diet ®” (abbreviated as optimiX®), a concept that has been improved and extended since then, and meanwhile is an accepted standard for child nutrition (Alexy and Kersting, 2008).

The idea was to develop a complete concept to offer healthy food to children during the course of a day, not only suggesting conceptions for single meals.

The Concept of Optimized Mixed Diet® - OptimiX®

This concept is based on the D-A-CH Reference Values of 2008 with its recommendations for nutritional components, but considers the special needs of children's food. optimiX® is an food-based dietary guideline (Alexy and Kersting, 2008).

Optimized Mixed Diet® - The Conception

The basis of optimiX® are 7 - daily menus being created under the consideration of various factors. In particular, the typical dietary patterns of families in Germany have been considered. In addition, optimiX® takes care that only traditional, readily available, and non-enriched foods are used. Furthermore, food items preferred by children and adolescents such as fast food and sweets are integrated. This approach ensures that the traditional dietary patterns are maintained (Alexy and Kersting, 2010). Following this diet recommendations, the need for energy, main nutrients, minerals and vitamins is reached on average for children from 4 to 6 years. Whereas the required nutrient density, i.e. the need for vitamins and minerals related to the energy supply does not change much in the course of life, the same rules can be considered at any age - only the absolute amounts consumed vary with age. Recommendations for children from 4 to 6 years were

extrapolated for older children according to the average power demand (Alexy and Kersting, 2008). A child fed according to these recommendations gets on average 13.8% of its energy from protein, 32.8% from fat and 53.4% from carbohydrates. The percentage of saturated fatty acids is 10.3E%, the monounsaturated fatty acids come to 15.2E% and polyunsaturated fatty acids are 7.3% of total energy intake. Including drinks, the energy density supplied contains 72 kcal/100g, the fiber density is 17 g/1000 kcal and the water density 1.17 g/kcal (Alexy and Kersting, 2008). These recommendations are in the margin of the reference values from the D-A-CH Reference Values.

Table 2: Recommended Daily Food Group Amounts by Age in OptimiX®

		2-3 years	4-6 years	% Total Diet
Beverages	ml/d	700	800	38.5
Bread, Grain, Potatoes	g/d	260	350	19.3
Vegetables	g/d	150	200	10.0
Fruits	g/d	150	200	10.0
Dairy, Cheese	g/d	330	350	13.7
Meat, Fish, Eggs	g/d	52	63	3.1
Oil, Fat	g/d	20	25	1.2
Confectionery ^a	kcal/d	110	150	3.5
^a Maximum 10% of daily energy intake				
Modified of original table according to Alexy and Kersting, 2010.				

Table 3: Percent (%) Food Consumption, Energy and Nutrients Provided by Food Groups in OptimiX®

Percent (%) of Daily Intake	Beverages and Plant Food				Food of Animal Origin		Fat and Sugary Food
	Fruits	Vegetables	Beverages	Potatoes, Bread, Grain	Dairy, Cheese	Meat, Fish, Egg	Fat, Oils, Confectionary
Consumption	9.9	10.1	38.5	19.3	13.7	3.1	5.5
Energy	6.8	2.7	0.2	42.4	12.7	7.9	27.3
Protein	3.4	6.1	0.0	40.0	24.5	21.6	4.5
Fat	1.1	1.0	0.1	12.7	16.1	14.8	54.3
Carbohydrates	11.2	2.8	0.3	61.5	7.5	0.1	6.6
Fiber	13.6	15.1	0.0	65.7	0.3	0.1	5.3
Water	10.0	11.3	46.2	13.2	14.1	2.5	2.7
Potassium	16.5	20.7	1.2	34.6	15.5	6.1	5.6
Magnesium	10.8	12.4	4.2	50.3	11.6	5.2	5.6
Carotene	3.0	79.7	0.0	1.8	1.3	0.2	14.0
Vitamin K	9.0	65.6	0.0	7.5	0.7	3.6	13.7
Vitamin B ₁	6.6	9.7	2.4	55.2	7.8	16.0	2.4
Folic acid	13.2	30.5	0.0	43.1	7.1	4.2	1.9
Vitamin C	35.2	48.7	0.0	8.9	2.7	2.6	1.9
Modified of original table according to Alexy and Kersting, 2010.							

'Recommended' and 'Tolerated' Food

As optimiX[®], with complete coverage of the recommended nutrient needs, only achieves about 90% of the recommended energy requirements, the remaining 10 E% can be supplied by low nutrient dense foods such as sweets, snacks or sugar sweetened drinks.

In the Optimized Mixed Diet these foods are described as 'tolerated' food (Alexy and Kersting, 2008).

The Arrangement of Meals During the Day

Since it is often impractical to give dietary recommendations for the entire daily food, optimiX[®] added recommendations for the composition of individual meals. Because optimiX[®] was developed by the Research Institute for Child Nutrition in Germany, the reference meal plans are based on the traditional food habits in Germany and therefore include five meals a day with the three main meals (breakfast, lunch, and dinner) and two snacks. One of the three main meals is served as a hot meal, two as cold meals with milk and milk products as a main part (Alexy and Kersting, 2008).

In addition, fruit or raw vegetables and cereals or sandwiches are served.

A cold meal may consist of a cereal made from yogurt, fruit and cereal flakes, a sausage sandwich with a glass of milk and an apple or a cheese sandwich with raw vegetables.

The warm meal consists of potatoes, rice, or noodles as a main ingredient with plenty of vegetables or a salad. In addition to that, about three times a week a small serving of lean meat is served as a supplement; once a week a meal with fish should be part of the menu. Vegetarian dishes with legumes (as a stew), potatoes, rice or pasta or other cereals should be served on the other days (Alexy and Kersting, 2008).

The both snacks are usually eaten in the morning, for example as breakfast in kindergarten, and in the afternoon, with raw fruits or vegetables preferred, accompanied by bread or cereals and a serving of milk or milk products. Sweets, biscuits, or cakes may be consumed occasionally (Alexy and Kersting, 2008).

The Average Distribution of Daily Energy Intake Should be as Follows (Alexy and Kersting, 2008)

- Main meal / morning 25 %
- Morning snack 12,5 %
- Main meal noon 25 %
- Afternoon snack 12,5 %
- Evening meal 25 %

Due to the different food compositions, the nutrient profiles of meals are different as well. The cooked main meal, for example, provides a lot of iron, while the body gets more calcium during the cold main meals.

The optimiX[®] pyramid shows the composition of each meal. The proportions of the meals are represented by the size of the surface of the food groups: Larger portions should be eaten from the food groups that form the base of the pyramid, smaller ones from those on the top of the pyramid (see figures 1-3) (Alexy and Kersting, 2008).

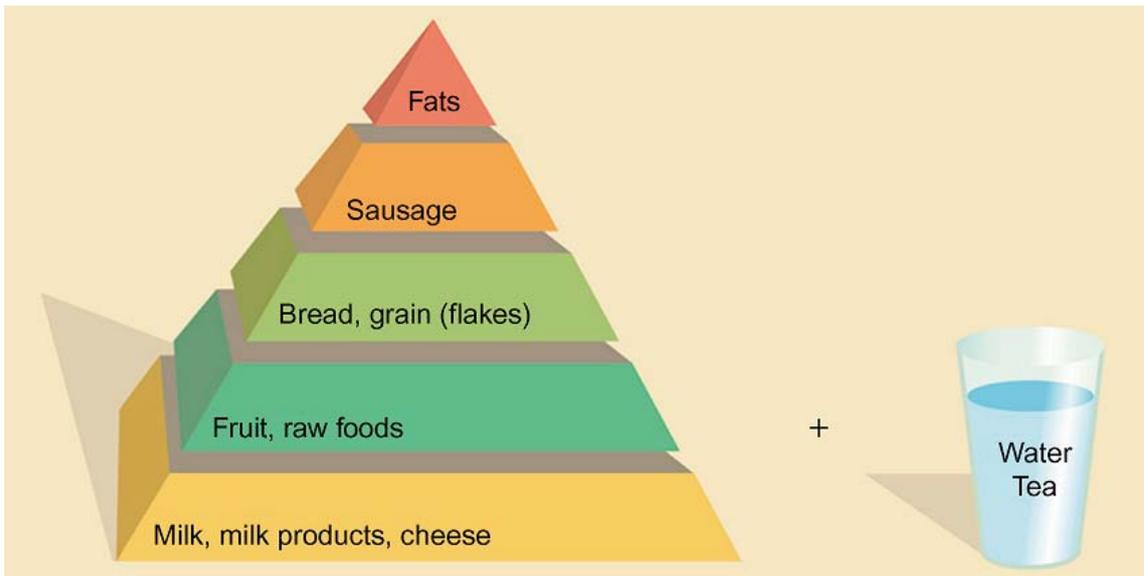


Figure 5: Composition of breakfast and dinner in optimiX® (Alexy and Kersting, 2008).

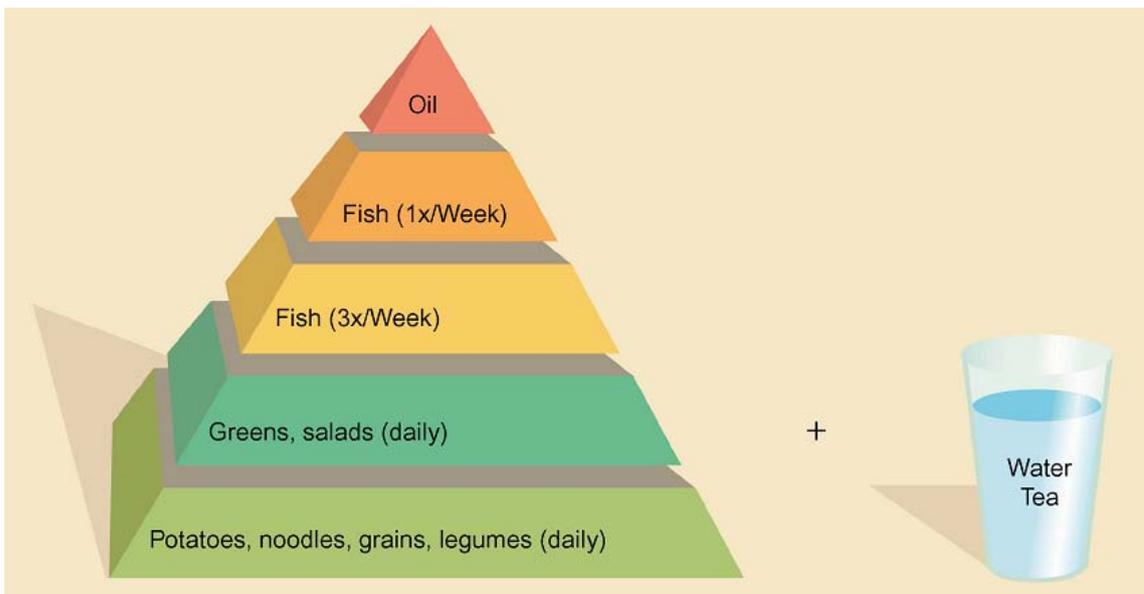


Figure 6: Composition of lunch in optimiX® (Alexy and Kersting, 2008).

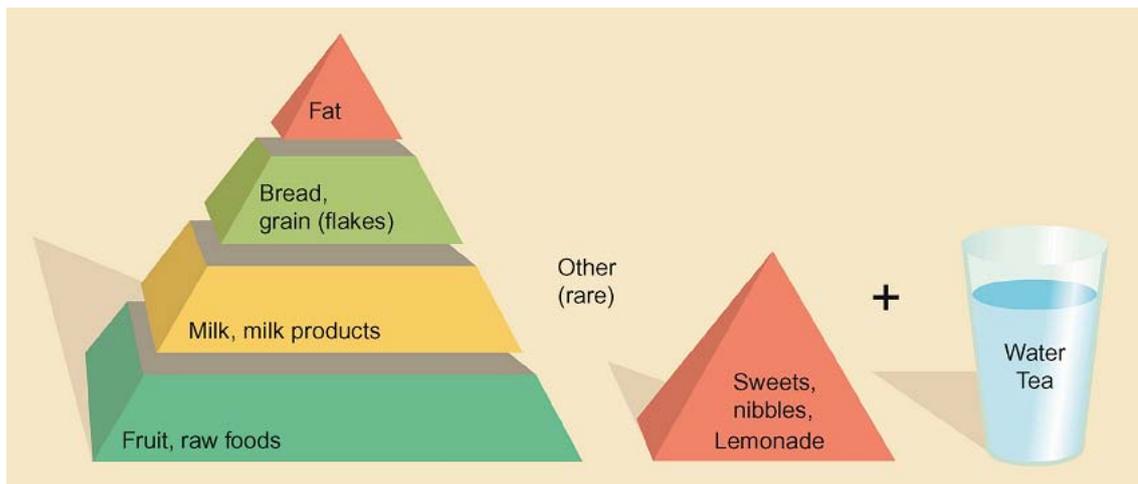


Figure 7: Composition of snacks in optimiX® (Alexy and Kersting, 2008).

Drinks

Drinks should be consumed in large quantities, but because of the obesity risk by consuming sugary drinks (including fruit juices), energy-free or energy-poor drinks should be preferred. Even milk is - due to the high energy content - one of the foods that should be consumed only in small amounts and is therefore not qualified as a drink but counts as a milk product (Alexy and Kersting, 2008).

Summary: Aims to Improve Child Nutrition:

- Plant foods, especially vegetables, bread and potatoes should be consumed by children and young people more often.
- The fluid intake should be increased by at least one cup of water per day.
- Whole grain products should be consumed more often.
- As dairy products fat-reduced milk products should be consumed more often.
- Low-fat versions of meat and meat products should be the choice.
- Improving the fat quality by increased use of rapeseed oil.
- Reducing the consumption of sweets and sweetened drinks.
- Reducing fast food consumption to a maximum of one to two times a week (Alexy and Kersting, 2008).

Survey of Nutrients

Recommendations for Children per Day

Table 4: Macro-Nutrients

	Age			
	1 to Under 4 Years		4 to Under 7 Years	
	Girls	Boys	Girls	Boys
Energy	1000 kcal	1100 kcal	1400 kcal	1500 kcal
Carbohydrates	52 % of Energy Intake			
Protein	13 g	14 g	17 g	18 g
Fat (g)	30-40 % of Energy Intake		30-35 % of Energy Intake	
Water (ml)	1300 ml		1600 ml	
Modified of original table according to ALEXY and KERSTING, 2010				

Table 5: Micro-Nutrients: Fat Soluable Vitamins

Vitamins	1 to under 4 years		4 to under 7 years	Function	Source
	Girls	Boys			
Vitamin A (mg)	0.6	0.6	0.7	Important for growth, the immune system and the development of cells and tissues, vision, development and maintenance of the skin, mucous membrane and cartilage tissue, infection defense ¹	Liver, butter, cheese, or as pro-vitamin A in carrots, peppers, leafy vegetables
Vitamin D (µg)	20	20	20	Formation of bones and cartilages	Fatty fish (herring, mackerel), liver, vitamin D-fortified margarine, egg yolks and some mushrooms, can be synthesized in the human body when exposed to sunlight
Vitamin E (mg)	5	6	8	Oxidation protection and cell regeneration, inhibits inflammatory processes ¹	Wheat germ oil, sunflower oil, corn oil, canola oil, wheat germ, hazelnuts
Vitamin K (µg)	15	15	20	For blood clotting and bone formation ¹	Vegetables, milk, milk products, lean meat, eggs, cereals, fruits
Table modified summaries according to D-A-CH reference values, 2008 and marked with ¹ according to Elmadfa and Fritsche, 2006.					

Table 6: Micro-Nutrients: Water Soluble Vitamins

Vitamins	1 to under 4 years		4 to under 7 years	Function	Source
	Girls	Boys			
Vitamin B ₁ (mg)	0.6	0.6	0.8	Functions in carbohydrate metabolism and energy metabolism is thus important for nerve and muscle function ¹	Muscle meat, especially pork, liver, some fish, whole grain products (especially oats), legumes, potatoes
Vitamin B ₂ (mg)	0.7	0.7	0.9	Necessary for energy production from fats, proteins and carbohydrates, good for skin and nails ¹	Milk and milk products, lean meat, fish, eggs, certain vegetables, whole grains
Niacin (mg)	7	7	10	Necessary for energy production and set-up and breakdown of carbohydrates, fatty acids and amino acids, stimulates memory and concentration ¹	Lean meats, organ meats, fish, milk, eggs, bread, baked goods, potatoes
Vitamin B ₆ (mg)	0.4	0.4	0.5	Provides conversion and degradation of amino acids, protects against neural injury ¹	Chicken, pork, fish, cabbage, green beans, lentils, lettuce, potatoes, bananas, whole grains, wheat germ, soybeans
Folic Acid/Folate (µg)	200	200	300	Important for cell division and cell to recharge ¹	Green leafy vegetables, cabbage, tomatoes, cucumbers, oranges, grapes, whole grains, potatoes, meat, liver, milk, dairy products, some cheeses, eggs, wheat germ, soybeans
Pantothenic Acid (mg)	4	4	4	Important for degradation of fats, carbohydrates and various amino acids, formation of fatty acids, cholesterol, bile acids, and porphyrin (part of the blood pigment hemoglobin), detoxification reactions, improves the immuneresponse of the mucous membranes, growth and pigmentation of hair, good for skin ¹	In almost every food, especially in liver, muscle meats, fish, milk, whole grain products, legumes
Biotin (µg)	10-15			Essential for the breakdown of vital protein components, formation of fatty acids, involved in blood clotting	Liver, soybeans, egg yolks, nuts, oatmeal, spinach, mushrooms, lentils
Vitamin B ₁₂ (µg)	1.0	1.0	1.5	Needed by every cell in the body, important for the absorption of folic acid, forms and regenerates red blood cells, important for nerve function ¹	Liver, muscle meats, fish, eggs, milk, cheese
Vitamin C (mg)	60	60	70	Antioxidant, stimulates the immune system of the body, the formation and maintenance of functional tissue, bone, cartilage, dentin, accelerates the healing process of wounds and bone breaks, activates and regulates the cell metabolism ¹	Fruits and vegetables, especially sea buckthorn berries, peppers, broccoli, blackcurrants, gooseberries, fennel, citrus fruits, potatoes, cabbage, spinach, tomatoes

Table modified summaries according to D-A-CH reference values, 2008 and marked with ¹ according to Elmadfa and Fritsche, 2006.

Table 7: Essential Dietary Minerals

Vitamins	1 to under 4 years		4 to under 7 years	Function	Source
	Girls	Boys			
Sodium (mg)	300	300	410	With potassium important role in acid-base balance, important for fluid balance and nerve function ¹	Salt, foods that contain salt, mineral waters
Potassium (mg)	1000	1000	1400	With sodium important role in acid-base balance, important for fluid balance and nerve function ¹	Bananas, dried fruit, spinach, mushrooms
Chloride (mg)	450	450	620	Necessary for nerve function	Salt, foods that contain salt, mineral waters
Calcium (mg)	600	600	700	Is necessary for the formation of bones and teeth, blood clotting and nerve impulse transmission ¹	Milk and dairy products, broccoli, kale, fennel, leeks, some mineral waters
Phosphorus (mg)	500	500	600	Necessary for the formation of bones and teeth and the acid-base balance ¹	In almost all food
Magnesium (mg)	80	80	120	Activates enzymes and is essential for the formation of protein ¹	Whole grain cereal products, milk, dairy products, liver, poultry, fish, potatoes, vegetables, soybeans, berries, oranges, bananas
Table modified summaries according to D-A-CH reference values, 2008 and marked with ¹ according to Elmadfa and Fritsche, 2006					

Table 8: Trace Minerals

Vitamins	1 to under 4 years		4 to under 7 years	Function	Source
	Girls	Boys			
Iron (mg)	8.0	8.0	8.0	Is part of the red blood pigment (haemoglobin) and of enzymes of energy metabolism ¹	Meat, sausages, wholemeal bread, vegetables
Iodine (µg)	100	100	120	As part of the thyroid hormone iodine, plays an important role in the regulation of cell growth, cell division, the basal metabolic rate and heat production ¹	Iodized salt, saltwater fish and marine products
Fluoride (mg)	0,7 mg and additional nutritional supplements as tablets		1.1	Serves to maintain the structure of bones and teeth ¹	Black tea, shrimp, meat and dairy products
Zinc (mg)	3.0	3.0	5.0	Is a component of digestive enzymes	Beef, pork, poultry, eggs, milk, cheese, whole wheat
Selenium (mg)	10-40	10-40	15-45	Activates thyroid hormones and is an antioxidant ¹	Meat, fish, eggs, lentils, asparagus
Copper (mg)	0.5-1.0	0.5-1.0	0.5-1.0	Component of enzymes that are important for metabolism and blood formation ¹	Cereals, organ meats, fish, shellfish, nuts, cocoa, chocolate, coffee, tea, some green vegetables
Manganese (mg)	1.0-1.5	1.0-1.5	1.5-2.0	Component and activator of enzymes	Tea, leek, lettuce, strawberries, oatmeal
Chrome (mg)	20-60	20-60	20-80	Function in carbohydrate metabolism	Meat, liver, eggs, oatmeal, tomatoes, lettuce, hot chocolate, mushrooms
Molybdenum (µg)	25-50	25-50	30-75	Component of enzymes	Legumes and cereals

Table modified summaries according to D-A-CH reference values, 2008 and marked with ¹ according to Elmadfa and Fritsche, 2006

Most Important Nutrients in Children's Nutrition

Calcium

The mineral calcium is necessary for bone and teeth health, blood clotting and the transmission of nerve impulses (Fritsche, Elmadfa, 2006). Especially in childhood, great amounts of calcium are needed for bone formation.

Good sources of calcium are milk and milk products. Some vegetables such as broccoli, curly kale, fennel and leeks are also containing calcium, as well as some brands of mineral water. In order to improve the calcium intake, calcium uptake should be spread over several meals throughout the day. Calcium deficiency symptoms include muscle cramps and bleeding disorders, as well as the development of osteoporosis in older age (D-A-CH, 2008).

Recommendations for children (D-A-CH, 2008):

- 1 to under 4 years: 600 mg / d
- 4 to 7 years: 700 mg / d

Sources:

- Milk and milk products
- Vegetables: broccoli, curly kale, fennel, leeks
- Some brands of mineral water

Deficiency:

- Muscle cramps and bleeding disorders
- At an older age development of osteoporosis

Sodium

Together with potassium, sodium plays an important role in acid-base balance, and both are important for fluid balance and nerve function. As an estimate, a minimum supply for children aged 1 to under 4 years should be 300 mg per day; for children aged 4 to under 7 years it should be 410 mg per day. Sodium is present in almost every food. Since it is a component of salt, it occurs especially in food which is usually salted, like bread, sausage, cheese, or convenience foods. However, some brands of mineral water also contain great amounts of sodium (Elmadfa and Fritsche, 2006). Both a deficit in sodium and an overdose lead to severe illness. Rarely, for example, severe diarrhoea may cause a sodium deficiency in children. This leads among others to dehydration, hypotension, apathy, and muscle cramps. On the other side, studies have shown that there is a relationship between salt consumption and the hypertension risk. A high salt intake may therefore increase the development of high blood pressure, one of the NCDs (D-A-CH, 2008).

Recommendations for children (D-A-CH, 2008):

- 1 to under 4 years: 300 mg/d
- 4 to 7 years: 410 mg/d

Sources:

- Salt
- Particularly foods rich in salt
- Mineral water

Deficiency:

- Dehydration
- Hypotension
- Apathy
- Muscle cramps

Iron

As part of the red blood pigment (hemoglobin), iron is important for the oxygen transfer. It is also part of electron-carrying active groups of enzymes within the energy metabolism. Iron deficiency may affect physical performance as well as the immune system. Iron-deficiency anaemia is a deficiency that results from chronically low iron intake (D-A-CH, 2008, Elmadfa and Fritsche, 2006).

An adequate supply of iron in infancy is of great importance because of the iron requirement of the brain during process of growth. For children aged 1 to less than 7 years, the recommendations are 8 mg iron per day. Regarding iron absorption, it is necessary to distinguish between iron of animal (heme iron) and plant sources (non-heme iron). Because non-heme iron is absorbed by the body in a minor degree, it should be considered that absorption promoting substances - such as ascorbic acid (vitamin C) or citric acid - are fed together with plant foods rich in iron. Thus, iron absorption will be improved. Main sources of iron are meat and meat products, as well as whole-grain products and vegetables (D-A-CH, 2008).

Recommendations for children (D-A-CH, 2008):

- 1 to under 7 years: 8 mg/d

Sources:

- Non-heme iron: whole grain bread, vegetables
- Heme iron: meat, sausages

Deficiency:

- Impairment of physical performance
- Iron deficiency anaemia

Iodine

As part of the thyroid hormones, iodine plays an important role in the regulation of cell growth, cell division, the basal metabolic rate and heat production (Fritsche, Elmadfa, 2006).

A lack of iodine affects the action of thyroid hormones. An iodine deficiency impairs the thyroid glands function and leads to the formation of struma.

Apart from iodized salt, sources of iodine are sea fish and marine products, but milk and eggs can also be high in iodine - an appropriate animal feeding provided (D-A-CH, 2008).

Recommended for children (D-A-CH, 2008):

- 1 to under 4 years: 100 mg/d
- 4 to 7 years: 120 mg/d

Sources:

- Iodized salt
- Saltwater fish and marine products
- With appropriate feeding of the animals: milk and eggs

Deficiency:

- Occurrence of struma caused by deficiency of iodine

Vitamin D

The fat-soluble vitamin D occupies a special position among the vitamins, since exogenous supply with food, but also synthesis by humans themselves when exposed to sunlight (UV-B light exposure) play an important role. Vitamin D as an important component of the calcium and phosphor metabolism contributes to the formation of bone and cartilage (Fritsche, Elmadfa, 2006). Vitamin D suppliers are fatty fish (such as herring or mackerel) which contain vitamin D in significant quantities, as well as liver and vitamin D-fortified margarine. Egg yolks and some mushrooms also contain vitamin D, but in much smaller amounts. The intake of vitamin D by the usual children's food is 1 to 2 µg per day. Attention should be paid to the fact that the estimated value for adequate intake in the absence of endogenous synthesis was raised to 20 µg per day in 2012. By frequent exposure to sunlight, the human organism can build vitamin D through endogenous synthesis in adequate amounts. But, it must be taken into account that vitamin D synthesis in the skin depends on geographical, climatic and cultural factors (D-A-CH, 2012).

For example, in northern Europe this compensation is only possible during the summer months, Beside the season, latitude and time of day, the sunshine duration and the time spent outdoors, the fact of how much the body is covered by clothing is influencing vitamin D synthesis. In addition, other factors like application of sunblocker, thickness and pigmentation of the skin play an important role. People with light skin can synthesize more vitamin D than those with darker pigmentation (D-A-CH, 2012).

A lack of vitamin D in infants' and toddlers' age leads to rickets, a disorder of bone mineralization with deformation of the skeleton. Other symptoms of deficiency are a

reduced muscle strength and increased susceptibility to infection. A child that received an adequate vitamin D supply in infancy will rarely suffer from infant rickets (D-A-CH, 2012).

Recommended for children (D-A-CH, 2012):

- Estimated value of 20 µg/d

Sources:

- Fatty fish (herring, mackerel)
- Liver
- With vitamin D fortified margarine
- Yolk
- Some mushrooms

By sunlight, the body can synthesize vitamin D itself.

For lack of sunlight vitamin D supplements should be considered.

Deficiency in children:

- Rickets

Folate

The water-soluble folate is mainly involved in cell formation and differentiation. Children need much folate as a result of the increased cell formation. According to this, folate plays an important role during growth (D-A-CH, 2008).

Wheat germ and soy beans are especially regarded as good sources of folate. Certain vegetables, for example green leafy vegetables like spinach as well as cabbage, tomatoes and cucumbers, and oranges, grapes, bread and baked goods made from whole grain flour, potatoes, meat, liver, milk (dairy), some cheese and eggs are also rich in folic acid (D-A-CH, 2008).

A folate deficiency is particularly evident as megaloblastic anemia, as the division rate of the red and white blood cells is reduced (D-A-CH, 2008).

Recommended for children (D-A-CH, 2008)

- 1 to under 4 years: 200 µg/d
- 4 to 7 years: 300 µg/d

Sources:

- Wheat germ
- Soy beans
- Green leafy vegetables (spinach, cabbage, tomatoes, cucumbers)

- Fruit: oranges, grapes
- Bread and baked goods made from whole grain flour
- Potatoes
- Meat and liver
- Milk, dairy products and some cheeses
- Eggs

Deficiency:

- Megaloblastic anemia

Conclusion

For the last years, scientist and public health experts more often report that people in developed countries run an increasing risk for developing overweight and obesity as well as other noncommunicable diseases. Alarming is the fact that even young children are overweight / obese or develops diabetes mellitus.

Getting aware of this development is the first step to change it. Several studies and reports worldwide confirmed this development showing that worldwide millions of children are overweight or obese and even more run the risk of becoming overweight which is the most important risk factor of NCDs. To work against this negative development there must be combined efforts in all parts of the community. There is a good chance of achieving a better consciousness for nutritional issues in all if children behave healthy. This, in turn, is the duty not only of parents and family members, but also of teachers - beginning in kindergarten and pre-school. The kindergarten and pre-school staff must be enabled to prepare healthy, good tasting food and in addition to show the children how to deal with food that may be “unhealthy” if consumed in to great amounts. Therefore, the idea was to provide pre-school teachers with a guide that helps to understand the most important backgrounds of a healthy nutrition for children.

Even the longest way starts with a single step. It is to believe that the initial steps are already gone.

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Chapter 3: Current Situation, Differences, and Problems in Participant Countries

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Introduction



The conditions of nutrition education in early childhood differ markedly in the participating countries. The following table shows the political and regulatory framework of each country with respect to the responsibilities and competencies of the kindergartens and day-care centres in general, and the vocational training of the educators in particular. In addition, several important aspects and issues concerning nutrition are listed. In order to avoid misunderstandings, below are some supplementary notes to clarify the terms “early childhood education”, “kindergarten”, “preschool” and “preschool education”.

Austria

Kindergarten

Local institutions in which children aged between three years to compulsory school attendance are supervised, educated, and cared for by professionals regularly (LGB 17, 2003).

Preschool

One year before primary school; classes are located in primary school buildings; no assessment of child’s performance – only certificate of attendance (BMUKK, 2007).

Preschool education

Compulsory school educations for children who are not yet mature enough to attend the regular primary school (BMUKK, 2007).

Compulsory primary school starts at the age of six. It depends on the child’s development status (e.g. cognitive and social abilities) if it attends preschool or compulsory primary school. Until compulsory school entry, childhood education is defined in Austria according to the OECD definition for early childhood education and care (Stanzel-Tischler and Breit, 2009) “all arrangements providing care and education for children under compulsory school age, regardless of setting, funding, opening hours, or programme content” (OECD, 2001).

Germany

The term “early childhood education” is used to refer to the period of time when children are educated in early childhood centres, i.e. before they attend primary school. It is not located within the public education system, but within the child and youth welfare sector. In some federal states (e.g. Hesse), special types of transition from Kindergarten to primary school exists (preschools). These preschools are attended by children who are not yet mature enough to attend the regular primary school.

Latvia

The term “preschool education” is used as a synonym for “early childhood education”. In the Latvian law of education “preschool education” is defined as follows: An educational level in which the multi-dimensional development of the child's personality, strengthening of their health and preparation for their primary education take place.

Romania

“Preschool education” is part of the “early childhood education”.

Preschool education is a type of formal education included in the national education system that is not compulsory for children aged 3 to 6 years. This is the first stage of formal education and has the specific objective of providing comprehensive child development (cognitive, physical, social, emotional) and to prepare the child for starting school. Preschool education is a part of early education. One year of preschool education is compulsory before attending school. According to the new education law (see V) this class has been moved from the preschool system to the school system being reclassified as grade 0.

Turkey

“Early childhood education” is part of the National education system.

Within this system children may either attend kindergarten or preschool or both. It depends on the age of the children and on the decision of the parents (see IV). The differences between the two types of provisions lie in different educational activities.

Table 9: Early Childhood Systems: Current Situation, Differences, And Problems in the Participating Countries

I. Political Background	
Austria	Federal republic with 9 federal states and 2357 municipalities
Germany	Federal republic with 16 Federal States and multiple regional governments (~412 districts and urban municipalities, 11142 communities)
Latvia	Unitary parliamentary republic and is divided into 118 administrative divisions of which 109 municipalities and 9 cities
Romania	National state, divided into 41 counties, with a single national government with local representatives
Turkey	Republic. Central administration is the core of the administrative structure, both in structural and functional aspects. Turkey has 81 administrative provinces in seven regions
II. Formal Responsibility for Education in Kindergarten	
Austria	Since 2009 the national education general plan for kindergarten education is the framework for kindergarten education, which is regulated by every federal state
Germany	Early childhood education is part of child and youth welfare. Shared responsibilities for early education between the Federal Government, 16 Federal States and municipalities the main responsibility is at the municipal level
Latvia	Early childhood education is part of child and youth welfare. Responsibility lies with the Ministry of Education and Science
Romania	Early childhood education is part of the national Educational Law valid since 01.01.2011. In kindergarten it is coordinated and supervised by the Ministry of Education and its local representatives. Also, the Ministry for Work, Family and Social Welfare and the Ministry of Health are involved.
Turkey	Administrative legislation and supervision related to formal and non-formal education is performed by the Ministry of National Education (MoNE). Early childhood education is part of the National Education system. The Ministry of Education is responsible for preparing preschool curriculum, maintaining coordination between educational institutions and constructing kindergartens.
III. Regulations for Education in Kindergarten	
Austria	Legislation for kindergarten education is given by the Austrian Federal Constitution, Federal Ministries and on the state level.
Germany	Diverse organisational and regulatory measures in the 16 Federal States
Latvia	Legislation for preschool education is stated by the Cabinet of Ministers (August 2010 Regulation No. 709) Regulations on the Guidelines for State Preschool Education Passed in accordance with the Education Law, Section 14, Paragraph

Romania	Regulations are stipulated in the law of education (National Education Law valid since 01.01.2011)
Turkey	Supervision of educational institutions is carried out both at central and regional (local or provincial) levels. The supervision of early childhood education institutions is performed at the provincial level by pre-primary education inspectors
IV. Obligatory/Compulsory Attendance of Kindergarten	
Austria	For children up to five years of age, kindergarten education is voluntary, followed by a mandatory kindergarten year for all five year old children
Germany	Voluntary attendance, very different enrolment rates, different supply and demand. Beginning 1.8.2013, 35% of children under 3 years of age will have a legal claim to a place in kindergarten
Latvia	For children up to five years of age, preschool education is voluntary, last two years are obligatory; legal claim to a place in kindergarten
Romania	Kindergarten is voluntary except for the preparatory group, the last stage before starting school, which is compulsory since 2008. Since 2008 legal claim to a place in a preparatory group.
Turkey	Early childhood education is optional for children. Compulsory education covers the education of 6-13 year-old children. It begins in September when children reach five years of age. Early childhood education is carried out so as to enable 37-66 month-old children to attend preschool, and 48-66 month-old children to attend kindergarten
V. School Entry	
Austria	At age 6
Germany	At age 6 – with a trend towards an earlier start
Latvia	At age of 7
Romania	In 2012: if the child is 6 years old he starts with grade zero, if he is 7, he starts with first grade. Effective 2013, all children start school with grade zero
Turkey	The end of September in the year when the child has reached five years of age
VI. Responsibility for Kindergartens, Responsible Bodies or Institutions	
Austria	60.1% of all kindergartens are run by public institutions, mainly municipalities, followed by private societies (24.3%), Christian Denominations (10.8%) and others (4.8%) like private persons
Germany	Around two thirds of the kindergartens are run by non-governmental agencies (54% churches, welfare associations and other), one third by municipalities
Latvia	Municipal kindergartens, seldom private
Romania	State and private kindergartens
Turkey	The total number of kindergartens in Turkey is 27,606. 24,383 (88.3%) of them are

	state owned, and the remaining 3,223 (11.7%), are run by private bodies
VII. Types of Kindergarten and Opening Hours	
Austria	Several types of kindergarten, e.g. 3 to 6 years, or 0 to 3, or mixed aged, different opening hours, full-day visit/ part-day visit
Germany	Several types of kindergarten e.g. 3 to 6 years, or 0 to 3, or mixed aged, different opening hours, full-day visit/ part-day visit, mostly closed on holidays
Latvia	Kindergarten for kids from 2 to 7 years. From 7:00 until 19:00. Full-day visit or part-day visit
Romania	Several types: from 3 to 6 years, from 0 to 6 years, kindergartens with crèches. Part day/short programme is 5 hours; full day is 10-12 hours daily crèches can also have a weekly programme
Turkey	Several types of kindergarten e.g. 48 to 66 month old children attend kindergarten. Different opening hours: full day visit /half-day visit (morning or afternoon)
VIII. Fees	
Austria	Free of charge: half-day care before and whole-day care during the mandatory kindergarten year. Some states offer more care possibilities for free.
Germany	Fees paid by parents, no fees in some Federal States or in the year before school, different fees for the parents for half and full day, extra charge for meals.
Latvia	Parents pay only about 2 -2.50 Euros/day for nutrition cost in municipality kindergartens. In private kindergartens parents pay for the kindergarten and nutrition.
Romania	Parents pay about 2 Euros/day for nutrition costs in state kindergartens. In private kindergartens prices differ according to the facilities that are offered and the opening times
Turkey	Public preschools and kindergarten are free of charge, but parents contribute to expenses related to meals and cleaning. Private pre-primary education institutions charge fees.
IX. Professional Training	
Austria	Different levels of educators in the kindergarten
Germany	Different levels of educators in the kindergarten, low academic background
Latvia	Bachelor degree in pedagogical education or pursuing a degree in pedagogical education
Romania	Bachelor degree compulsory since 2008, before pedagogical high school degree required, or any type of high school degree, followed by 2 years of qualification in the field
Turkey	Teachers for early childhood education are trained at bachelor's level. A four-year-bachelor's degree is compulsory in order to be a teacher.
X. Regulation of the Curricula	
Austria	The curriculum is defined at federal level although schools have an area of autonomy in which they can decide on their own

Germany	Different curricula in each Federal State
Latvia	Preschool educational program for preschool educational institutions is provided by the Ministry of Education and Science.
Romania	A unitary curriculum is provided by the Ministry of Education.
Turkey	The Ministry of Education provides the early childhood curriculum
XI. Nutrition in the Curricula of the Educators	
Austria	Nutrition too small a part of the curricula of the educators
Germany	Nutrition too small a part of the curricula of the educators
Latvia	Nutrition is too small a part of the curricula of the educators
Romania	Nutrition too small a part of curricula. There exists a unit on physical development, health and personal hygiene, which has a three part subsection, one of which concerns promoting health and nutrition
Turkey	Inefficient nutrition coverage in the curricula of the educators. Shortcomings in the contents of the lesson "Mother-Child Nutrition", which is included in the Curriculum of the Preschool Teacher Education Department
XII. Nutrition in Curricula in General	
Austria	Nutrition too small a part of the general curricula
Germany	Nutrition too small a part of the general curricula
Latvia	There is a nutrition curriculum in general, but it is not enough
Romania	Nutrition too small a part of the general curricula
Turkey	While some goals and gains are related to nutrition in early childhood education curriculum, they are not satisfactory. Nutrition-related activities take part in daily program.
XIII. Meals Provided	
Austria	Different situations, breakfast provided by parents, kindergarten or caterer; lunch cooked by kindergarten or caterer
Germany	Different situations, breakfast provided by parents, kindergarten or caterer; lunch cooked by kindergarten or caterer
Latvia	Children are provided with 3 hot meals a day, which are made on the spot in the kindergartens
Romania	According to programme length: a) Short programme (08-13): breakfast and lunch as well as an optional snack); b) Long programme: breakfast, lunch and 2 snacks. Food is often prepared at the kindergarten, seldom by caterers
Turkey	Different situations, breakfast provided by parents, kindergarten or caterer; lunch cooked by kindergarten, parents or caterer
XIV. Special Problems	

Austria	25% of all children in childcare facilities have different mother tongue than German
Germany	About 20% of children have a familial immigration background, different levels of fluency in German language
Latvia	21.5% of seven year-old children have excessive body mass, including obesity
Romania	Represented by the over 100,000 children left in the country by parents who emigrated (one or both parents), the integration of Roma children and also the large number of children (25-35) in some kindergarten
Turkey	The unsatisfactory proficiency level of early childhood education
XV. Special Nutrition Problems	
Austria	Heterogeneous eating behaviour due to immigration, cultural, religious and socio-economic background
Germany	Heterogeneous eating behaviour due to immigration and social background
Latvia	There are no special nutrition problems (except health issues) in the kindergartens. For now, there aren't big cultural differences
Romania	Heterogeneous eating behaviour due to a lack of a unitary dietary concept
Turkey	The effect of socio-economic conditions, education level, and local and cultural differences on eating behaviour
XVI. Nutrition Practice in Daily Routine	
Austria	Nutrition and nutrition literacy is not a central theme in the federal framework plan for kindergarten education
Germany	Nutrition or food literacy is emphasised too little in the curricula and in the goals of the single kindergarten
Latvia	No information on health problems related to nutrition for preschool age children is compiled at the national level
Romania	Nutrition or food literacy is emphasised too little in the curricula and in the goals of the individual kindergartens
Turkey	Activities in nutrition hours are taken as opportunity to practice nutrition
XVII. Nutrition Education	
Austria	Different approaches and focuses regarding nutrition education in kindergarten
Germany	Different nutrition education in each kindergarten. Three times per year an unpaid offer for dental health and nutrition is made available by Social Security and can be voluntarily used by kindergartens
Latvia	There are unitary "Regulations on the Guidelines for State Preschool Education"
Romania	Different nutrition education in each kindergarten
Turkey	Different nutrition education in each kindergarten, the reason for which is based on the difference in the interests of parents, teachers and school administration
XVIII. Materials About Nutrition Activities	
Austria	Good materials concerning nutrition are not common enough in kindergarten

Germany	Good materials concerning nutrition activities are not common enough in kindergarten
Latvia	A topic on health and nutrition is not included in preschool educational programs; there is a lack of teaching aids
Romania	Deficiency in materials concerning nutrition available both for professionals and as teaching material
Turkey	Lack in educational materials related nutrition (interest corners, tools, kitchen utensils, inefficient use of available tools)

Conclusions

While nutrition education in early childhood is regulated centrally in Latvia, Romania and Turkey, in Germany and Austria there are shared responsibilities (Federal Government, Federal states and municipal/local institutions). This applies accordingly to the curricula and the vocational training of the educators.

The comparison between the countries shows that all kindergartens must deal with this topic being that they are responsible for the nourishment of children, but they accomplish it in different ways.

There is a wide variety of educational material on nutrition available in Germany and Austria, however many kindergartens are unaware of these materials. In addition, these countries face special problems deriving from the high proportion of families with an immigration background.

Generally speaking, the subject of nutrition in the curricula of the participating countries must focus to a greater extent on early childhood. The kindergarten teachers would like to have more information and advanced training. They want to know more in different, science based and more organised ways.

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Chapter 4: Teachers Attitude towards Nutrition Education in Kindergarten in Participating Countries

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In this part the synthesis of the results of a qualitative interview performed in each country on kindergarten educators are presented.

The questions assessed the realities of approaching the subject of nutrition in kindergarten in the participating countries. More specifically we gathered information about aims of nutrition education, proper time for nutrition education, the offered meals, about rituals and rules regarding eating behaviour, daily routine, the parental involvement, difficulties encountered by the educators.

Table 10: Synthesis of Interview Methodology

Country	Number of Interviews	Type of Kindergarten		Evaluation Type	Interview Form
Austria	23	2 public kindergartens		MAXQDA	Expert interview conceived by Verena Bauer and Alin Sava after Philip Mayring
		11 private kindergarten (3 catholic)			
Germany	4	2 heads of kindergarten	2 catholic kindergartens	MAXQDA	
		2 staffs of kindergarten	1 protestant kindergarten		
			1 kindergarten from municipality		
Latvia	2	heads of kindergarten	1 public 1 private	Qualitative content analysis	
Romania	6	teachers from state owned kindergartens		Qualitative content analysis	
Turkey	94	85 teachers	23 public kindergartens	Qualitative content analysis	
		5 heads of kindergartens			
		4 cooks	2 private kindergartens		

Table 11: Synthetic Presentation of Interview Results in Participating Countries

Is Nutrition an Issue in Kindergarten?	
Austria	For the kindergarten teachers nutrition is important but they have not so much time for it.
Germany	For the kindergarten teachers nutrition is important but they have not so much time for it.
Latvia	No it is not.
Romania	Educators admit that children should learn in kindergarten about healthy nutrition, but this subject is not specially approached.
Turkey	Teachers say that “even though nutrition is an important issue and one of the goals of the Ministry of Education, some variables like time and financial restrictions pose several problems”.
Do Kindergartens Offer Meals for the Children?	
Austria	All participating kindergartens offer breakfast, lunch and an afternoon snack. Children can choose from different meals e.g. vegetarian or meals without pork. All types of meals focus on an adequate nutrition. Deep-fried food and sweets are offered seldom. Generally, fruit is served for breakfast and vegetables for lunch. Furthermore, in all participating kindergartens whole grain products are obtainable every day. Fish is served once a week. The most frequently offered drinks are water and unsweetened teas.
Germany	It is different in each kindergarten. In some kindergartens the parents are responsible for breakfast and snacks; the lunch is offered by a caterer or self-cooked. In some kindergartens all meals are offered by a caterer or self prepared.
Latvia	All kindergartens in Latvia offer 3 hot meals a day: breakfast at 9.00 am, lunch at noon and an afternoon snack at 4.00pm. If a child has problems with health or doesn't eat something, parents notify the kindergarten and for this child are prepared special meals. The menu is prepared for 2 weeks and it has been focused on a balanced diet.
Romania	All kindergartens offer breakfast and lunch, some of them also offer one or two snacks.
Turkey	Half-time kindergartens offer breakfast and snack while full time kindergartens offer breakfast, lunch and two snacks.
Are There Any Rituals Regarding the Eating Area, Food, Drinks?	
Austria	16 out of 23 kindergartens have a special eating area. Kindergarten teachers teach children in how to lay the table. Before children eat they have to wash their hands and after lunch they help to clean.
Germany	All kindergartens have rituals, but they are different. Some of the kindergartens have one common healthy breakfast/week or month prepared from the kindergarten.

Latvia	All kindergartens have a special eating area. The children are taught how to lay a table, and after the lunch they help clean the table. Children have to wash their hands before eating.
Romania	- There are some kindergartens with insufficient space that use the classroom also for dining and sports, other have a gym and courtyard; - There is a dining program.
Turkey	In most of the kindergartens meals are eaten in the classrooms, but some others have kitchens where children can have their food and drinks.
Are There Any Rules About Food in Kindergarten?	
Austria	Besides hygienic rules e.g. children should wash their hands before eating, they have to lay the table and clean it up after eating. Children should sit correctly while eating, not playing with foods, use cutlery and try every offered dish at least. If parents prepare food for the kindergarten, they should choose healthy and various products and no sweets. If parents wish their children have to clean their tooth after eating, teachers do this with the children.
Germany	- All kindergartens have rules, but they are different. -All kindergartens have a pedagogical concept, some very short, some very long.
Latvia	Nutrition has to be made on the spot; it has to be everyday fresh. An example of the food has to be held in a fridge for 24h, so if something wrong is with the food, they can know from where. There have been developed nutrition standards for appropriate age children. In the kindergartens are forbidden French fries, ketchup, mayonnaise, sugar-sweetened beverages. The parents are not allowed to give food to children, when they are going to the kindergarten.
Romania	- There are no clear rules known by the teacher; - Parents can influence children's menu; -The nurse is involved in establishing the allowed / not allowed food
Turkey	Teachers observe the pupils follow these rules: personal hygiene, good manners, eating the meals up (not leaving them over in the plate), not being choosy for meals and eating them in the due course of time.
Are the Parents Informed About These Rules? How?	
Austria	Information and rules concerning food and nutrition are communicated via parent-teacher conferences at the beginning of the kindergarten year.
Germany	The parents are informed about the concept and regulations by papers, internet, parent-teacher-conferences.
Latvia	The parents are informed one the first day about the rules, for specialized questions there are parent-teacher meetings.
Romania	Parents are informed about the daily menu. There is a panel that displays the next day's menu.
Turkey	Notice boards and panels are used to inform parents about menus, or pupils are given menus to submit them to their parents.

Do the Educators Develop Projects About Nutrition?	
Austria	The project MOGI, which is organized by the Department of Nutritional Sciences of the University of Vienna, is the first nutrition project in each participating kindergarten.
Germany	Sometimes, but the educators have not so much time. External experts like dental services come twice/year in the duty of the health insurances or other nutrition experts.
Latvia	No there hasn't been a project in the kindergarten.
Romania	There are some projects, but not many. The main topics are set by the curriculum.
Turkey	Daily nutrition activities parallel with the goals and objectives included in the preschool education curriculum are held as well as some seminars for parents. However long-term functional nutrition projects have not been developed yet.
Which Are the Aims of Nutrition Education?	
Austria	Assuming what children are eating at home, kindergarten teachers want to serve healthy nutrition at least in the kindergarten. They want to introduce children into a variety of foods, especially fruit and vegetables, and into different ways of preparation. The interviewed kindergarten teachers want to teach healthy nutrition and initiate awareness for their needs.
Germany	The teachers try to reduce sweets and sweet juices as to introduce healthier products. They have e.g. special days for potatoes or apples and one sugar free morning/week or for baking of bread or Christmas cookies.
Latvia	So the children are eating healthier. That the children have tasted all of the healthy products and they know the taste of those products.
Romania	Educators try to develop healthy food behaviour and appropriate personal hygiene.
Turkey	Teachers aim to teach pupils why healthy dieting is important, what the right dieting habits are how to choose the correct food and how to observe the personal hygiene rules.
What Is the Proper Time for Nutrition Education?	
Austria	The basis must set at home by the parents as early as possible.
Germany	The basis must set at home by the parents as early as possible.
Latvia	As soon as the children start going to kindergarten. But it should be started in the family. Nutrition education is provided in pre-school program, but it is a small part from the entire program.

Romania	Educators admit that nutrition education should begin as early as possible.
Turkey	Teachers emphasize that nutrition education should be given during preschool education.
What Is the Proper Time for Nutrition Education in Daily Routine in Kindergarten?	
Austria	Nutrition education is mainly part of the daily routine, although it depends on age of the children, season and on the individual interest and engagement of each kindergarten teacher.
Latvia	Nutrition education is part of the daily routine, it depends on age of the children, season and on the interest and engagement of each kindergarten teacher.
Romania	Nutrition education is mainly part of the daily routine, it depends on age of the children, season (autumn is most often the period to talk about fruit and vegetables) and on the individual interest of each kindergarten teacher.
Turkey	Nutrition education is mainly part of the daily routine. Nutrition-related activities take part in daily routine and special days for example cultural events considered as an opportunity also it depends on age of the children and on the individual interest of kindergarten teacher.
Is There Enough Time for Nutrition Education in Kindergarten?	
Austria	Nine kindergarten teachers think that they would need more time, because healthy nutrition is very important for health prevention in children, adolescents and adults. Seven teachers noted to have enough time and three think nutrition education should be more integrated in the daily routine. Besides, five kindergarten teachers mentioned to need more time for parent-teacher conferences where nutrition education should be discussed.
Germany	No, the teachers had not enough time. The training for independence, self-esteem, solutions for problems at home, training in hygiene and exercise are more important.
Latvia	All of the teachers are saying that it is not enough time spent on nutrition education. There are nutrition education lessons, but most of the part these lessons are learnt in practice, while they are trying to make food, smear bread etc.
Romania	No. There are many other topics set by the curriculum that need to be approached, so educators can't spend much time teaching children about nutrition.
Turkey	Generally yes, but it is being conducted through various activities integrated into curriculum during and out of meal times.
Did You Enquire Difficulties Regarding Nutrition Education?	
Austria	The most mentioned difficulties are problems concerning parents: lack of implementation of healthy nutrition at home, e.g. too less fruit and vegetables intake or use of sweets as reward for well-mannered behavior. On the other hand

	<p>too high amounts of new “healthy” dishes could be problematic because children refuse eating them. Furthermore, kindergarten teachers have to be motivated at first.</p> <p>Kindergarten teachers would need more lectures and practical courses on nutrition during their education and they would like to have regularly advanced trainings.</p>
Germany	The teachers want professional external help, more money for nutrition projects or other materials, more special rooms for projects, more courses for the German language for the children.
Latvia	Lack of methodic materials. The program is made, but methodic materials
Romania	Sometimes, the healthy behaviours learned in kindergarten are not supported at home. Lack of time. Lack of materials and money for interactive games: preparing food, cooking with the children.
Turkey	Parents’ insufficient level of awareness, lack of sustainability in nutrition education when pupils go home, insufficient parental support, poor curriculum content, financial restrictions and lack of governmental support
Are There Any Differences in Nutrition education of Children from Social Disadvantaged Families?	
Austria	The majority of kindergarten teachers make no differences concerning nutrition education on social disadvantaged groups. Although teachers observed that a healthy lifestyle and healthy nutrition is more relevant in families which are not social disadvantaged.
Germany	The different migration backgrounds and the problems with the German language must be provided.
Latvia	No there are not.
Romania	Socially disadvantaged children are neither identified nor included in special programs.
Turkey	Teachers say that there might be differences between socially disadvantaged children according to some variables related with their families like income, education level, social structure and current problems.
How Good is the Knowledge About Nutrition Education for Children?	
Austria	The majority think to be well informed although more than the half admits that their knowledge could be improved.
Germany	The teachers have less courses about nutrition in their vocational training. They have own experiences from at home and from books.
Latvia	Majority think that they know enough about nutrition, but many also say that the knowledge is not enough.

Romania	Educators admit that they don't have enough information about healthy nutrition.
Turkey	Teachers admit that they had nutrition education during their undergraduate education. While they use various resources like book and the Internet to update and improve their nutrition education, they need in service training on it.
Is Vocational Training Offering Sufficient Information about Nutritional Education for Children?	
Austria	Training offers only one seminar on the topic nutrition and one course in which nutrition is included.
Germany	Further education but this is not very extensive. There are offered very good materials e.g. from AID, DGE and BMELV but they are unknown.
Latvia	Information about nutritional education for children, but the vocational training could be more.
Romania	Information on this topic. There is no course in the curricula on the topic of nutrition or nutrition education. Educators have to find that information on their own. Unfortunately the literature on this topic addressing children is also poor.
Turkey	Some basic nutrition education, they say they need to be motivated and directed to be able to transfer it to preschool level activities. They would like to be given in-service training on actual nutrition education topics as well as appropriate education methods and techniques to give better education.

Conclusions

The results show the acute need of the teachers to receive information on nutrition subjects. This information should be received in an organised manner, in the frame of an adequate curriculum in each country; it should have a scientific base. The information should be organised so as to be accessible for preschool educators and adequate for the involved age group. The educators also pointed out the utility of inviting field specialists to talk about nutrition related subjects to the children, as this type of activities are enjoyed by them. The educators observed the limited time available for this topic as the curricula is overloaded. They suggested allocating special timeslots for these subjects in the educational plan.

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Chapter 5: Methodology for Teachers to Reach Parents and Children

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This chapter presents information about parental involvement and early childhood activities concerning food and nutrition in an easy to understand. Each chapter begins by introducing and explaining activities and continues with examples of activities.

Parent Involvement Activities

“This chapter was inspired by several major resources. These resources were presented in the references”.

Early childhood educators need to craft and use responsive concepts and strategies in involving parents, families, and communities in strengthening children’s early learning and development (Swick, 2004). Families are a major source in determining whether or not a child will learn successfully (Swadener, 1994). Parents and families should be actively involved in learning activities of their children. Teacher should actively seek parental involvement and pursue partnerships with children’s families (Couchenour and Chrisman, 2010). During early childhood family is the main setting for children to learn and develop food preferences and eating habits. After kindergarten entry kindergarten/preschool teachers, peers and other people at the kindergarten, together with media and social leaders become more important (Perez-Rodrigo and Aranceta, 2001).

Parent involvement can be accomplished with the following examples;

Parent Needs Recognition Form

The first step of all parental involvement activities is “needs analysis”. To determine what the parents need within the scope of child development and education will help the teacher to make a proper parental participation plan, and thus increasing the rate of participation.

Idea:

Figure 8: The Sample of Parent Needs Recognition Form

Parent's name and surname:.....

Child's name and surname :.....

DEAR PARENT; we aim to plan parent participation activities related with children and nutrition topics, and would like you to participate in them. There are some topics below about children and nutrition. Which of them would you most like to be informed about? Could you please tick the ones that interest you and the meeting frequencies? Thank you very much for your contribution...

Health and Nutrition Relation

The Role of the Family in Healthy Nutrition Habit Acquisition of Children as a Role Model

The Role of Preschool Education in Nutrition Education

The Significance of Parent-Teacher Cooperation in Nutrition Education

To Increase the Fruit and Vegetable Consumption

Precautions to Develop Healthy Nutrition Habits

Eating Problems in Children

Sample Nutrition Education Activities in Household

Healthy Food Choice

Workshop Activities with Parent-Child-Teacher Participation on Healthy Food Choice

Please write, if any, other subjects you would like to be informed about:

1.....

2.....

3.....

Meeting Frequency

Once a week

Every two weeks

Once a month

Once a term

Board of Education

A board of education can be prepared to supply parents with important information or to point out different subjects. It might be prepared every month or every two months. The board should have posters about the topic with legible passages, attractive pictures and interesting titles, and it should be placed in an easily visible place

Idea:

Tips to Make Time for Breakfast

1. Do some of your morning chores the night before, such as selecting clothes to wear and getting backpacks ready for school.
2. Set the alarm for 15 minutes earlier to allow more time to prepare and eat breakfast as a family.
3. Skip the audio-video temptation: make breakfast time about eating rather than watching TV, playing video games or using the computer. You may find it easier to get out of the house on time as well.
4. Offer something non-traditional like leftovers from the night before.
5. Have items available in your kitchen that can be quickly and easily assembled in the morning such as whole grain cereals with milk, fresh fruit, or yoghurt.

Posters

Posters can be made particularly about the subjects parents should be informed about. A striking message and supportive picture should cause a sensation.

Idea:

Why is breakfast the most important meal of the day? Here are just a few reasons why your child should eat breakfast:

- Studies show that eating breakfast everyday is important in maintaining a healthy body weight. Starting your child's day with a healthy breakfast will also make them less likely to eat high-calorie snacks during the morning.
- Eating a well balanced breakfast improves their intake of fibre, vitamins and minerals, especially calcium, iron and vitamin C; these nutrients are essential in a balanced diet. In fact, a good breakfast provides one-fourth of the day's energy and nutrient needs.
- Children who eat a healthy breakfast tend to show improved academic performance, longer attention span, better attendance and decreased hyperactivity in school.
- Skipping breakfast will often make your child feel tired, restless or irritable by mid-morning. By eating breakfast, your child will have energy throughout the morning and help him/her to concentrate better in class. This also means fewer trips to the school nurse's office.

Booklets

Booklets are very useful for parents to follow the developments and innovations about children and education. They also make parents informed about the activities and projects their children are involved in. They can be prepared about different topics as follows:

Ideas:

Guide Booklets about Child Development and Education

Idea: The role of the family in healthy habit acquisition of children as a role model. The parent-teacher cooperation in nutrition education is a precaution to develop healthy nutrition habits, healthy food choice, and to limit eating problems in children.

Trip booklets

Idea: We went to a farm today. We learned from which animals and how milk is obtained from. Children most wanted to know how the animals are milked. We fed the animals and drank the milk altogether.

Activity Booklets

Idea: Booklets with similar activities for parents and children to those made at school (e.g. making salad with children at home and talking about the health benefits of vegetables, revising the peculiarities of vegetables like their names, colours, tastes, benefits if activities related with vegetables were made at school).

Recipe Books

Idea: Children's favourite recipes, idea recipes from the preschool kitchen, recipes children have tried during their activities.

Personal Booklets

Idea: My favourite food, we ate spinach at school; I like milk very much because it is useful for my bones and teeth, etc.

Journals-Newspapers

Schools can issue newspapers in various ways. Content can be determined by the administrator, teachers or in cooperation with parents.

The content of the newspaper may be as follows:

- a. Informing parents about classroom activities
- b. Educational goals of classroom activities
- c. Information about child development
- d. Building the family library

Idea:

Nutrition newspaper (might be used monthly)

Possible Headlines:

Breakfast and Its Significance

How can you prevent your child from eating junk food?

How many meals should children eat a day?

How many portions of different food groups should children eat a day?

Photos

The photos of classroom activities, projects, meals, breakfast, school trips, etc. should be taken so that parents can be informed about them. These photos will also help the parents see and learn about the school environment.

Idea:

The Album of What We Have Eaten at Lunch

The Album of How We Brush Our Teeth

Correspondence

Correspondence should be a two-way communication made between school and parents. It might be about the child's development, eating, sleeping, activity involvement, peer communication, and health.

Idea:

"Dear parents,

Canay didn't want to eat the leek at lunch today. She ate only pizza. She usually resists eating vegetables. I believe that we can work out her vegetable and fruit eating habit. I would like to invite you to school in your suitable time to talk about this issue.

The teacher"

Newsletters

Idea:

News from our classroom - Fruit day

"Mum-dad, we are holding fruit day at school on Thursday. We are going to make fruit salad with our teacher and friends. Will you please help me to buy fresh fruit for school?

Your daughter Ece"

Idea:

Breakfast is the most important meal that affects a child's attention and achievement. It helps the body to get energy and to start the day healthily after a long night without food intake. A breakfast should include high quality protein sources as milk, cheese, eggs, and fruit and vegetables like tomatoes, carrots, cucumbers, etc., as well as bread or cereals. Grape molasses or jam and honey may also be consumed at breakfast. However, food rich in fat and sugar (sausages, sweets ...) are not recommended by experts.

Participation in Classroom Activities

Parents can participate in activities as observer, supporter, leader or guide in any activity.

Idea:

- Involve parents in classroom activities and projects.
- Invite parents, family members, grandparents to have breakfast or lunch at the kindergarten etc.

Conferences

Conferences should be held at regular intervals to make parents informed about various topics and discuss about problems. They could be held at least twice a year, and the conference topics should be related with the current problems parents experience with their children. The lecturer should be determined, the topic shouldn't be too general, and it should tell about the content. The parents should be informed about the place, date, and time at the right time earlier.

Idea:

"Dear parents,

1. Would you like to have sufficient information about the healthy diet principles for your child?
2. Don't you have information about food groups?
3. Don't you know how you can cope with your child's junk food eating habit?

We would like to invite you to our conference to discuss about these topics with our specialist

Date:

Place:

Time:

The Teacher"

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Early Childhood Activities

“This chapter was inspired by several major resources. These resources were presented in the references”.

Early childhood is a critical time for the development of food preferences and eating patterns (Stang, 2006). Factors that influence dietary intakes and nutritional status of young children include food preferences, food availability, parental modeling, praise or reward for food consumption, and peer behaviors (Stang, 2006; Carruth, Skinner, Houck, Moran, Coletta and Ott, 1998 and Birch, 1980). Early childhood education is significant for a young child, which will benefit future education and life. Thus, great attention has been given by early childhood specialists and researchers to this topic and different teaching and learning approaches are being developed (Man Queenie, 2005).

Early childhood education institutes play significant roles in the development of healthy eating patterns among children. They are some of the most functional environments for nutrition education because children spend a significant time of the day in these kindergartens are catered under the supervision of well-informed teachers, meeting with peers and other role models and readily available educational and instructional materials (Aktaş and Angın, 2011).

Children from different cultural groups have different health concerns, eating patterns, food preferences, and food-related habits and attitudes. These differences need to be considered when designing lesson plans or discussing food choices (Page and Page, 2003). Also seasonal features, religious fests, and special occasions can be evaluated as an opportunity for nutrition education.

This part of the guidebook will give advice for practicing different food and nutrition learning activities for kindergarten children.

Key Concepts

The key facts are delivered through four key concepts on food groups and their peculiarities (color, size, shape, texture etc.).

- a. Food groups and their peculiarities
- b. Foods in food groups and their peculiarities
- c. Where does food come from?
- d. Eat variety of food and food choice.

For each key concept the following is provided

- a. Learning objectives
- b. Classroom activities (art, play, drama, science, mathematics, kitchen work etc.)

Table 12: Key concepts and learning objectives of food groups and their peculiarities

Key concepts	Learning objectives
1. Food groups and their peculiarities	<ul style="list-style-type: none"> - Become familiar with the food groups - Identify different food groups - Describe the food groups - Identify a variety of foods within each food group - Classify foods into the appropriate food groups
2. Foods in food groups and their peculiarities	<ul style="list-style-type: none"> - Identify different types of foods - Identify different types of grain products - Identify different types of vegetable products - Identify different types of fruit products - Identify different types of milk products - Identify different types of meats and beans products
3. Where does food come from?	<ul style="list-style-type: none"> - Understand that all food comes from plants or animals - Sort a number of foods into plant or animal groups - Give examples of foods from animal sources - Give examples of foods from plant sources
4. Eat variety of food and food choice	<ul style="list-style-type: none"> - Talk about foods they like and dislike, with reasons - Understand that we eat different food depending on the time of the day, occasion and lifestyle - Explain the importance of eating a variety of foods from all of the food groups

Early childhood nutrition activities can be accomplished with the following tips. Tips based on range of hands on and interactive activities for early childhood period.

NUTRITION ACTIVITY TIPS

Hang posters/pictures of food groups around the classroom and school area.

You will need:

- Posters and
- Pictures of food groups

Idea:

You can find pictures in magazines, internet and newspaper etc.

Talk with children about food groups with food guide or cards, posters in language activity.

Display a list of healthy food groups.

You will need:

- Food guide of your country
- Cards and posters of food groups

Choose a “Nutrition Word of the Week”, and use that word within your activities.

Ask children a nutrition question as they arrive for class. Discuss the question and answer it during the activities closure.

Ideas:

- What do we need to grow up and build up?
- Where does food come from?
- Foods and their origins

Use the food groups for names when assigning children to play groups in play activities.

Ideas:

- Grain group
- Vegetable group
- Fruit group
- Milk and milk product group
- Meat and bean group

Invite a guest such as a dietitian/nutritionist/pediatrics to speak to children about healthy foods and healthy food choice in science activity.

Compose a healthy-eating, food group's song with children in music activity then have children perform the song with a creative dance.

Ask children to talk about a vegetable that is native to their country in language activity before reading a story about vegetables.

Organize food groups by the colors and names of food groups on food guide with pictures of foods in art activity.

You will need:

- Pictured food guide
- Crayons

Firstly, show children all food groups, than tell them "close your eyes" and hide one food group. Ask children which food group is absent in play activity.

You will need:

- Paperboard pieced food group

Create a food group bulletin board with fun facts and pictures with children.

You will need:

Food pictures from different food groups (grain, vegetable, fruit, milk and milk products, meat, and beans).

Idea:

You can find pictures in magazines, internet and newspaper etc.

Give pictures of foods and drinks to help children create a healthy plate meal. At the end of the activity, children should compare their “plates” with each other in art activity.

You will need:

- Plastic plate
- Glue
- Pictures of food and drinks

Write activities on the backs of pictures of healthy foods. Give each child a picture. Then, each child has to do the activity written on the back of his or her picture (e.g., hop on left foot, run in place).

You will need:

- Food pictures
- Cards
- Glue
- Pencil
- Scissor

Visit a local farmers’ market or grocer to learn about the process of growing healthy fruits and vegetables.

Play the “Fruit & Vegetable Game”. Hide pictures of fruit and vegetables among pieces of sponges in a large box. Assign children into the groups fruit and vegetables. Ask vegetable group to pick up the vegetables in the box and fruit group to pick up the fruit. The group which collects the most items within a defined timeframe will be the winner.

You will need:

- Big box
- Pieces of sponges
- Fruit and vegetable pictures
- Scissor

Talk with children where vegetables come from and how they are raised and grown. Grow vegetables in a school garden in science activity.

You will need:

- Tomato, cucumber and parsley seed etc.
- Excavation
- Water
- Shovel

Prepare a notice board which tells about nutrition and food items with children at regular intervals. Let them reinforce their attainment through exploration.

Ideas:

Importance of eating a variety of foods from all food groups

Healthy eating related to normal growth

.....

In science activity, give children the opportunity to try new foods and learn about where this food comes from. Let them discuss about the taste, shape and smell of the food and encourage them to talk about what they feel.

You will need:

- Fruits, raw vegetables, milk and milk products etc.

Stick some letters on walls in a play activity and ask them to touch the letters by doing some movements (rocking, skipping with one foot or feet, tumbling, etc.) and then call the name of a food beginning with that letter and its group.

You will need:

- Tape
- Letters on the paper

In an art activity, make a placemat with children. Give out A4 papers with a blank food guide and some food pictures cut off from various magazines. Then paste the food pictures and their names by putting them into the correct food groups. When you cover the papers with a film, you will have placemats.

You will need:

- A4 Paper with blank food guide on
- Glue
- Scissor
- Food pictures from magazines or internet etc.

Play the game “Do you hear what I hear?” with children. Let them test and try the foods like popcorns, cucumbers, apples or lettuces. Talk with them about the sounds they make if you take a bite.

You will need:

- Popcorn, cucumber, apple, lettuce etc.

Bring fruit and vegetables with different textures, shapes and sizes to the classroom. Ask the children to put their hands into the sack and guess what the food is from their textures, shapes, and sizes. Then ask whether it is a vegetable or fruit. Finally taste it together. It might be encouraging for them to try new foods in a science activity.

You will need:

- Bag
- Different vegetables and fruits

Idea:

- Hairy: peach, kiwi. Smooth: tomato, apple. Nodule shaped: potato, strawberry.
- Tall: carrot, cucumber, celery.

Assign children into different food groups with different colours and tell them which colour represents which food group (orange for wheat, green for vegetables, red for fruit, blue for milk, and lilac for meat and beans). Then explain the game with a sample. For instance "When I say strawberry, all those wearing red will jump up and clap their hands!" Play until every group has had a chance to jump up several times.

Ask children to choose their favourite fruit out of the pictures you have cut off from magazines and paste them under your writing "my favourite fruits".

You will need:

- Scissor
- Fruit pictures from magazines and internet etc.
- A4 paper
- Glue

Write the names of children on plastic glasses. Fill them with sand and plant the seeds of different plants (wheats, barley, oat, rye) with children and then observe their growing. Have a chat with them about where these plants are grown and count how many types of wheat you have planted.

You will need:

- Plastic cups
- Water
- Paper
- Soil
- Tape
- Pencil
- Grain seed

Divide children into two groups and stick the pictures of different foods at the back of the children in one group. Then ask them to find out the food on their back by asking various questions about food peculiarities to the other group and tell which group they belong to.

You will need:

- Different healthy food pictures from magazines or internet.
- Tape

Bean mosaic: Talk with children about the types and varieties of legumes. Then examine some types of legumes and seed samples with children. Talk about their colour, shape and texture. Then give the children cartoons designed with flower pictures, glue and a bowl of legume and seed samples. Let them decorate the flowers as they wish.

You will need:

- Beans, chickpeas, lentils, nut, pistachio, peanut and walnut shells etc.
- Glue
- Flower sketched paperboard
- Small cups

Meet food group: Give the children papers with pictures from different food groups. Identify the food groups in the first column. And then tell them to find and circle the food in each section to the right that is in that food group. There may be more than one for each group.

Idea:

Table 14: Foods and Food Groups and Matching Activity Sheet

Name:	
Meet food group	
Vegetable Group Food pictures	Three pictures from different food group two food pictures from same group
Fruit Group Food Pictures	Three pictures from different food group two food pictures from same group
Grain Group Food Pictures	Three pictures from different food group two food pictures from same group
Milk/-Product Food Pictures	Three pictures from different food group two food pictures from same group
Meat and Bean	Three pictures from different food group two food pictures from same group

Organize a field trip to a farm. Ask the farmer to talk about livestock that they raise and how the food gets from the farm to the plate. Taste different farm fresh foods and animal products.

Bring yellow, red, and green apples in science activity into the classroom. Show children that there are three types of apples. Talk about the colours and sizes of the apples and ask them what they think about the taste of those apples and which of them they have liked most. Later have a chat with children about where apples are grown and sold. Tell children that apples may have different colours and that it is very useful for health to eat colorful fruits.

You will need:

- Yellow, red and green apple
- Knife
- Plate

From the farm to the plate. Give children sheets with food pictures from plant and animal origin. Tell children to draw a line from the picture of the food to the plant or animal it comes from.

Idea:

Foods and origins matching activity sheet

Name:	
From Farm to Us	
Cherry	Chicken
Milk and cheese	Wheat
Bread	Cow
Egg	Tree

A trip to the farm drama activity. Lie on the floor with children. Everybody should close their eyes. Children should visualize the things you are telling. "Now, everybody is getting on the car. Do you have any idea about where we are going? We are going to the farm and we are going to learn how milk is obtained there. Now follow me in your cars. Yes here we have just arrived. We are parking our cars and getting off. Can you see the cows? We are going to milk them. Yes, let's take our buckets and milk the cows. Can you hear the voice of milking? Well done to you all. The buckets are full of milk. Congratulations. Let's boil the milk now and drink some. Pour the milk into the pot. Mmmmm, it smells delicious. Let's put some milk into our cups. Wow a big cup! Good appetite!

Idea:

You can do the same activity with cheese and yoghurt.

The Good Food Song

(Tune: "Old MacDonald Had A Farm")

Vegetables are good for me, EE I EE I O

And so I eat them happily, EE I EE I O

(Children take turns naming vegetables they like best)

With a carrot, carrot here, and a carrot, carrot there

Here a carrot, there a carrot

Everywhere a carrot, carrot.

Vegetables are good for me, EE I EE I O.

Idea:

You can sing this song using other food groups.

We are making "The Food Groups Mobile". Have a talk with children about food groups (names, colours, numbers, etc.). Then make a food groups mobile with them. Give each child various food pictures from different food groups, a pair of scissors, glue, paper towel roll, construction paper, and ropes with different colours which represent different food groups. Ask the children to cut the pictures and stick them on the construction paper. Then punch the pictures and tie them on the paper towel with totes. Your food group mobile is ready now. When the mobile of each child is finished, they will have learned what the food groups are and get familiar with various foods in different food groups.

You will need:

- Paper towel roll (for each child)
- Construction paper
- Scissors
- Glue
- Ropes with different colours which represent different food groups: (orange for wheat, green for vegetables, red for fruit, blue for milk, and lilac for legumes)
- Punch

DRAMA***The Child Who Doesn't Like Milk***

The teacher tells the children to sit down after placing their seats in the half-moon setting, and then tells that she/he is going to tell them a story called "The Child Who Doesn't like Milk" and asks them to listen silently.

Once upon time, Julia, Julian, and Ceren stay in Giray's family house and get ready to go to school together after breakfast. Giray's mother suggests that he should go to the shop and buy something to serve his friends for breakfast. Giray goes to the shop happily but cannot decide what to buy after having a look at the shelves as there are such things as milk, yoghurt, the yoghurt drink ayran, cheese, and butter, which Giray dislikes. "I don't want to buy these for my friends. I must buy more delicious foods like candies or chocolate." he says and tries to reach the candies on the top shelf, but he cannot manage it. At that time, he hears the big milk on the shelf saying "If you had drunk me so far, you might be taller and reach any shelf you wish. Don't you know that children drinking milk are taller?" Giray says "No, I didn't, so let me buy a few cartons of milk and drink it with my friends before going to bed." Milk says "Good idea, because children at your age should drink two glasses of milk every day." Giray puts four cartons of milk into his shopping basket but they drop them suddenly. He speaks to himself: "How heavy they are! I cannot carry them. I have dropped the basket!" The yoghurt cannot help talking to him when he hears Giray's words and says: "If you had eaten a box of yoghurt every day, your bones would have been built better and would be much stronger now, and you would be able to carry the basket much more easily. But it is not too late for you. If you eat yoghurt from now on, you will have strong bones and they will not get ill when you grow up. And you don't have to eat me straight. I can be a very delicious soup and if I am put into cakes or pies, they can be much tastier". Ayran also starts speaking and says: "Yoghurt is right. If you would like, you can drink me as well. I am made of it. You can also drink me with meals. If you buy me, you will have something useful to offer your friends." Cheese also joins the conversation and says: "you can serve cheese at breakfast as well. Or you can put me in pies. I am also a very valuable food for you and children at your age." Giray is surprised again and says: "If you are all so useful, I will buy you." He picks up the cartons of milk and put them in the basket with the other dairy products: yoghurt, ayran, and cheese. Then he asks the assistant to help him carry the basket. When the assistant lifts the basket easily, he says: "Wow, how easily you can lift it!" The assistant says: "If you eat and drink all these you have bought, believe me you will be stronger and healthier one day. I have been eating and drinking them with pleasure since I was a child. That's why I am very healthy. "The assistant puts the basket on the counter and Giray moves toward it to pay. After paying, Giray takes all the foods home with the help of a supermarket assistant. While going home, he dreams eating and drinking all these delicious foods and looking forward to telling what has happened at the supermarket to his friends because he likes his friends very much and wants them to be healthier as well.

After finishing the story, the teacher has a short chat with children and asks them the following questions:

- Who were the characters in our story?
- Why did Giray go to the shop?
- What happened in the shop?
- What did he buy there? Why?

After children answered the questions, the teacher says: "Now we will dramatize this story. You will be the characters. Let's choose who will play which character." Teacher puts the cards with pictures of a child, a mother, a man, a glass of milk, a pot of yoghurt, and a glass of ayran, a little bit away from each other on the floor and says "Now, I will play music and you will dance. When I stop the music, those who have picked up the cards will dramatize the character on the card. Following the character setting, the teacher guides the children to stand in the proper places and the activity starts. The teacher assists the children when they are confused during the dramatization. At the end of the dramatization, the teacher asking the following questions:

- What was it like to be "milk"?
- What did the milk and the others tell Giray?
- Which character would you like to be in this story? Why?
- Why should we drink milk? What happens if we don't? (It is asked for other products as well). (Filiz Erbay, Personal Communication, 07 July 2011).

The teacher has a brief conversation with children by telling them the following:

“This morning I saw an old lady her name is Lena. She was very ill. Her bones were very weak and she had lots of pain and difficulties in walking or carrying something. Why do you think her bones were weak? Do you think she would be ill if she had had milk and dairy products like ayran, cheese or yoghurt? Why? What? Would she be like now? What about you? Do you eat this foodstuff regularly? What will the children who eat or drink these products will be like? What activities can they do easily?”

Later, the teacher tells the children: “Now we will play a game” and shows the empty wall by saying: “We will paint a picture on this wall, but it will be different from other pictures because this wall will be our cardboard and you will be the figures on it. I want you to think about what the children who regularly consume milk and dairy products look like, what actions they can do easily. Then I will hit the drum once and you will dramatize the actions of those children in front of the wall without speaking. When I hit the drum a second time, you will stop acting and stay as if you were frozen. Thus we will make the picture of healthy children who drink milk. Finally, I will come close to each of you and touch your head. Whoever I touch will tell us what he/she has done and then sits where he/she is. When all of you are touched, our game is over.” The dramatization activity is carried out according to the steps described above.

When the activity is over, the teacher asks the children to sit down. At the evaluation part, the teacher asks the children the following questions and gets them to share their feelings and opinions:

-What figures were there in the picture?

-Why did you become -----?

-What did you think your friends were doing when you saw their dramatization?

-What else do you think could be in this picture?

-What would the picture have been like if we had made the picture of children who have never consumed dairy products? Why do they feel different? (Filiz Erbay, personal communication, 07 July 2011).

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Chapter 6: Best Practices for Nutrition in Early Childhood in Participating Countries

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The early childhood is a period when children do not choose themselves what to eat, but they depend on what is offered by their parents. The tastes learnt in childhood are the most stable aspect in choosing foods through the entire life. What is usual and generally accepted for someone; it is innovative for others. The countries engaged in the project have different experiences in managing the nutrition of early childhood. However, there is one concern – healthy nutrition of children - in all the five countries participating in the project. Therefore, an idea emerged to summarise a few best practice examples from each country engaged in the project. Best practices of each country are different. Therefore, two types of best practices are summarised the first type relates to nutrition education, the second one relates to nutrition management.

Best Practice Example of Early Childhood Education in the Field of Nutrition in Austria

Best Practice Example 1 - Project Name MOGI – Milch-Obst-Gemüseinterventionsstudie (milk-fruit-vegetable-intervention study)

Name of Organisation/Project Implementer:

University of Vienna, Department of Nutritional Sciences funded by the Austrian Federal Ministry of Health

Project Aim:

Preschool age is a very sensitive period of time for physical and intellectual development. Furthermore, in this stage of life dietary habits are established and sustain preserving. Unhealthy dietary habits in early childhood may account to non-communicable diseases in adulthood.

Austrian Nutrition Reports showed that children consume not enough vegetables, fruit, and dairy products although these food groups would support their health and development. This situation is even worse in social disadvantaged groups. The aim of this project is to increase the consumption of fruit, vegetables and dairy products in kindergarten children.

Project Target Group:

Preschool children, parents, kindergarten teachers

Project Stakeholders:

Austrian Federal Ministry of Health, responsible organisations for preschool education, kindergarten teachers

Project Description/Approach**Objectives:**

Increase of the consumption of fruit, vegetables and dairy products especially in social disadvantaged preschool children.

Comparison of different approaches: nutrition information, financial support and a combination of both.

Project Description:

The project has started in March 2011 and is still running. The duration of the intervention is twelve weeks. It has basic analyses are conducted via literature research, qualitative (kindergarten teachers) and quantitative questionnaires (children, parents), anthropometric measures (children). The socio-economic status of the family is determined by the Family Affluence Scale of the WHO. The participating kindergartens are distributed into one of six groups (three intervention and three control groups). Nutrition information (theoretically and practically) is given in all intervention groups in three modules, which were integrated in the daily kindergarten routines. Module one focuses on sensory perception and healthy snacking. Module two deals with fruit and vegetables and module three with dairy products. All modules start with an attention seeking introduction like a game and work out the topic together with children, parents and teachers. While the children are monitored by projects' employees they deepen their knowledge by nutrition games. At one and the same time parents and teachers enlarge upon their knowledge by a more detailed nutrition lecture. After this, children, parents and kindergarten teachers cook a healthy meal and eat together. If it is necessary, a native speaker translates the modules.

Social disadvantaged families in one intervention and one control group are economically supported. Those families need to collect the bills for food purchase one week before financial support and during the intervention period.

After 12 weeks questionnaires and anthropometric measures are conducted again.

Challenges:

Besides lacking of time in the kindergarten, it was problematic to motivate social disadvantaged families to participate in the project. Participation rates and compliance improved in smaller groups (ten children max.) as well as if the kindergarten direction and teachers identified themselves with the project.

Project Results and Evaluation:

The project is still running but will be finished in spring 2012.

Measure: Impact of the project is measured in participating rates, by quantitative questionnaires and anthropometric measures.

Success: Until today 136 children participated in the project and kindergarten teachers as well as children are very engaged.

Recommendations and Conclusions:

- Include children, parents and teachers. Make it comprehensible for all children and parents independent of educational background. Make it as practical as possible.
- teachers it should be easy to adopt this project in every kindergarten
- Design the questionnaire as short and comprehensible as possible
- Integration of children, parents, and kindergarten teachers is very important
- Motivate teachers to motivate parents and children
- Work with small groups
- Give only basic information and use practical skills like games, stories, songs, cooking to deepen the theoretical inputs
- The intervention period needs more time than 12 weeks
- A more compulsory approach e.g. participation of the whole kindergarten ; integration in to the curriculum

Best Practic Example 2 – Project Name “Academy of Nutrition and Food Safety” since 2012 Academy of Nutrition

Name of Organisation/Project Implementer:

Austrian Nutrition Society, Viennese Health Promotion, University of Vienna, Department of Nutritional Sciences

Project Aim:

The topic nutrition plays a minor role in the education/curricula of Austrian kindergarten teachers. Nevertheless, nursery, kindergarten and after-school-care teachers (pedagogues) are aware of the importance of healthy nutrition in pre-school age and elementary-school age. They want to implement adequate nutrition in the kindergarten routine and support children to develop healthy eating patterns. The aim of the “academy of nutrition and food safety” is to strengthen kindergarten teachers in their nutrition competences and to support them in their daily nutrition education.

Project Target Group:

Kindergarten teachers

Project Stakeholders:

Austrian Ministry of Health, Austrian Fund for Social Affairs, Viennese Health Promotion, Austrian Nutrition Society, Department of Nutritional Sciences at the University of Vienna, kindergarten teachers, municipal authority of Vienna, food companies

Project Description/Approach

The “academy of nutrition and food safety” targets on the increase of nutrition knowledge and nutrition education competences in kindergarten teachers, assistants and heads of kindergartens → multiplier approach

The project start has started in 2006 as a model project by the Austrian Nutrition Society; since 2010: cooperation of the Austrian Nutrition Society with the Austrian Fund for Social Affairs, Viennese Health Promotion and different stakeholders in Upper Austria and Carinthia.

The academy lasts for one school year (September to July).

The “Academy of Nutrition and Food Safety” focuses on the impact of diverse food groups on health and well-being, methodical and didactic aspects as well as practical skills within five modules:

Module 1: from theory to practice

Module 2: beverages and cereals

Module 3: fruit and vegetables

Module 4: protein and fat

Module 5: daily nutrition routine in kindergarten and school

Each participant gets support in creating a nutrition project in his work-place (in the cradle, nursery, after-school care). To improve sustainability and impact, selected projects are entered into a project database for pedagogues.

Nutrition experts work out basic nutrition knowledge as well as sensitive topics like the consumption of sweets and practical approaches for nutrition education in kindergarten. Furthermore, individual experiences and nutrition education literature round out every module. Every participant gets extensive papers according to the module's contents. Participation is followed by a written exam. Afterwards they get a certificate and are encouraged to spread their newly acquired knowledge in regular meetings of kindergarten teachers.

The "academy of nutrition and food safety" is evaluated continuously.

Challenges:

Lack time in kindergarten and the worse working situation (too less staff and room facilities) force some kindergarten teachers not to participate in further education courses. Furthermore and due to the current funding situation, only employees of public kindergartens can participate, but all stakeholders are engaged to solve this problem.

Project Results and Evaluation:

900 kindergarten teachers and assistants have participated until May 2012.

Measure: All participants fill out feed-back questionnaires after every module and at the end of the program. The evaluation of the course includes a combination of internal and external assessments and a documentation to test the level of nutritional-knowledge attained by each participant. Every participant receives an official certificate stating his acquired level of qualification, imparted skills and knowledge.

Success: Due to the good feed-back and documented evidence in improvements in target settings, the project is enlarged continuously.

Recommendations and Conclusions:

- Prepare easy to understand nutrition information with the possibility to get further information.
- The academy provides a lot of practical tips for nutrition education in kindergartens and built a network for exchange between kindergarten teachers.
- It is easy to adopt this project in every country, although country specific adoptions might be useful
- Motivate teachers to motivate parents and children
- Work with small groups
- Give basic information and use practical skills like games to deepen the theoretical inputs show possibilities for practical nutrition education in kindergarten like songs, games...

- Give literature for more information
- Importance of quality assured course materials
- Provide a project database
- Try to reach other target groups like primary school teachers
- Practical approaches on cooking with children (and their parents)

Best Practice Example of Early Childhood Education in the Field of Nutrition in Germany

Best Practice Example 1 - Implementing project days in the “Lutherkindergarten”, Fulda/Germany and developing a perpetual calendar, 2011/12

Name of Organisation/Project Implementer:

Food Kids, project in Profue.V. at the University of applied sciences, Fulda

Project members: Julia Blaumeiser, Christin Kessler, Helena Paczkowski, Lena Rinke, Miriam Schmalzl

Project Aim:

The targets of the project were to increase the knowledge of healthy nutrition among children and parents and to motivate children and parents to engage themselves in food preparation.

The problems were that Lutherkindergarten has a high proportion of children with a familial immigration background and socio-economically disadvantaged children.

Project Target Group and Stakeholders:

- 12 preschool children of the “Lutherkindergarten” (altogether 48, 52% with familial immigration background from 12 countries, status 2012)
- Parents
- Kindergarten teachers and head of the Kindergarten
- External implementer (project Food Kids)

Project Description:

- Literature review (key words: healthy nutrition)
- Selection of a kindergarten
- Analysis of the situation: need for nutrition education
- Approach: develop concepts for project days and a perpetual cooking calendar (tailored to the needs of the target group)
- Project management
 - Milestones
 - Timetable
 - Coordination meetings
- Development of a perpetual cooking calendar:
 - Design
 - Choosing recipes together with the children
 - Looking for sponsors (e.g. health insurance, supermarket, pharmacy)
 - Distribution (free calendars for the participating children, public sale of the remaining calendars)
 - Overhead for reprint

Challenges:

- Too few financial resources
- Higher workload than expected (looking for sponsors, time for meetings)

Project Results and Evaluation:

- Implementation of project days
- Development and successful sale of a perpetual calendar
- Positive feedback from the kindergarten with respect to the project days and the calendar
- Health insurance AOK (main sponsor) bears the expenses for the printing and distribution of the calendars and also distributes them

Recommendations and Conclusion:

It is important:

- That children and parents participate in the project days
- That there is good project coordination and project management (with milestones and a timetable)
- To find an appropriate graphic designer and print shop with respect to costs
- To consider the different cultural backgrounds and eating habits of the children
- To consider the diet-related diseases of the children

The following should be reconsidered:

- Better calculation of the costs
- Looking for sponsors in a more effective way
- The number of nutrition topics dealt with scientific basics and recommendations are to be tailored to the target group

The following worked out well:

- The sustainability of the project is ensured as the calendar is designed as a perpetual calendar
- The design of the calendar meets the needs and requirements of the target group and appeals to the children.

Best Practice Example 2 - Implementing a nutrition week in the day care centre “Sonnenschein”, Fulda (Aschenberg)/Germany, 2011/12

Name of Organisation/Project Implementer:

Project NUTGECS (MSc Public Health Nutrition) at the University of Applied Sciences, Fulda

Project members: Andrea Daniels, Svenja Humme, Nadine Müller, Corinna Rahe, Anja Riedel, Annalena Schraut, Theresa Stachelscheid

Project Aim:

The targets of the project were:

- To sensitise preschool children to the subject of “nutrition” (short-term)
- To integrate healthy nutrition into the daily routine of the day care centre (long-term)

The barriers and problems were:

- The „Aschenberg“, community of Fulda, has a high proportion of children with a familial immigration background
- Nutrition education is not established in the day care centre „Sonnenschein“
- The kindergarten teachers have neither enough time nor the required qualifications to work out and to implement a concept for nutrition education

Project Target Group and Stakeholders:

- 90 preschool children of the day care centre „Sonnenschein“ (78% familial immigration background from 5 countries, status 11/2011)
- Kindergarten teachers and head of the kindergarten
- Parents
- External implementers (project NUTGECS)

Project Description/Approach:

- Selection of the district and the kindergarten (criteria: high proportion of children with a familial immigration background)
- Problem analysis: semi-structured expert interview with the head of the day-care centre
- Results:
 - There is an urgent need for nutrition education for the children and their parents
 - The kindergarten teachers do not have enough nutritional background or time
 - There is no adequate kitchen for cooking for oneself
 - The head of the day care centre cannot choose the caterer
- Planning and realisation of a “nutrition week”
- Schedule:
 - Monday: the “nutrition pyramid”

- Tuesday: the importance of fruits and vegetables
- Wednesday: sugar
- Thursday: the role of vitamin D and calcium in promoting bone and dental health
- Friday: the importance of a healthy breakfast in kindergarten and school (“my breakfast box”)
- Structure data:
 - 2 groups
 - About 10 children in each group
 - 30-minute units every day
- Work out a manual for the implementation of a nutrition week in the day care centre (target group: kindergarten teachers and external professionals)

Challenges:

- Considering the fact that parents and kindergarten teachers are important stakeholders, they were not involved enough in the project
- The outcome evaluation (oral interview/group discussion with the children at the end of the nutrition week) should be reviewed
- Sponsoring (materials, food)

Project Results and Evaluation:

Results:

- Implementation of a nutrition week
- Development of a manual for the implementation of a “nutrition week” for kindergarten teachers and external implementers

Evaluation:

- Methods of outcome measurement: qualitative evaluation
 - Observation protocols (target groups were observed every day)
 - Feedback from the head of the kindergarten two weeks after the intervention
 - Oral interview/group discussion with the children after the intervention
- Success was not easy to measure because of methodological problems with the oral interview/group discussion
- Sustainability of changes:
 - Depends on how dedicated the kindergarten teachers are
 - Depends on how often the intervention will be implemented (e.g. once/twice a year)
 - Depends on whether it will be a long-lasting intervention or only implemented once

Recommendations and Conclusions:

- The manual can be adopted by kindergarten teachers, or other external implementers able or qualified to work with the target group, because it includes all necessary information.
- The manual has to be adapted to given conditions.
- The involvement of all stakeholders is important. If the kindergarten teachers had been committed to the project, the outcome of this project would have been more successful (e.g. the topics of the week could have been discussed and reviewed with the children afterwards). Parents also should be more involved to ensure sustainability.
- The issues „physical activity“ and „relaxation“ (in terms of the holistic WHO-definition of health) should also be central themes in addition to a „nutrition week“.
- The different institutions running a kindergarten should employ Kindergarten nutritional scientists (Kindergarten-Oecotrophologe). As experts in the field of nutrition they could act as advisers for the institutions and the caterers, or as implementers of (long-term) nutrition education programs.

Best Practice Example 3 - Recommendations for improving the nutrition in the day care centre “Zauberhut”, Frankfurt/Germany, 2011/12

Name of Organisation/Project Implementer:

Hannah Günther, Bachelor of Science (BSc) Oecotrophologie at the University of Applied Sciences, Fulda

Project Aim:

The target of the project was to improve the nutrition situation in the day care centre and therefore develop recommendations in the following fields:

- Meals (breakfast, snacks and lunch)
 - Catering concept and mealtimes
 - Assessment of the meals: do they match the recommendations of the quality standards for nutrition in day care facilities for children published by the German Nutrition Society
- Kitchen staff
 - Food preparation (knowledge about food, appropriate methods of preparation)
 - Processes in kitchen, work routine
 - Menus (creation, documentation and presentation)
 - Establishing a database of recipes
- In General
 - Lack of a dining room
 - Handling of special occasions e.g. birthdays, sweets... (summarized in a booklet)
 - Hygiene standards for food brought in by parents (summarized in a booklet)
 - Food literacy

Project Target Group and Stakeholders:

- 71 children (from 18 countries with 87% familial immigration background, status 1/2012)
- Kitchen staff
- Kindergarten teachers and head of the kindergarten
- Parents
- External implementer (Hannah Günther)

Project Description/Approach:

Analysis of the situation:

- Several interviews with the head of the kindergarten over the course of the project
- Semi-structured expert interview with the teachers at the beginning
- Questionnaire for parents over the course of the project

- Interviews with the children after the meals about how they like the food components (over the course of the project)
- Interview with the regular cook's substitute (over the course of the project)
- Assessment of the meals based on the quality standard for nutrition in day care facilities for children published by the German Nutrition Society

To discuss the steps that are necessary to change the situation, the kindergarten formed a team of representatives of kindergarten teachers, the head of the kindergarten, kitchen staff, and in some cases, parents as well. These groups agreed on

- Changing the following items: catering concept and mealtimes, handling of sweets in everyday life in kindergarten, rules about what kind of food can be brought to a birthday party, etc.
- Preparing a booklet containing general information about nutrition in the institution and the items mentioned above
- Furnishing a room that is currently used as a group room as a dining room with new furniture and a self-service counter where food can be kept warm and cold
- Having the kitchen staff trained by a cook

In addition to these steps, the project implementer recommends the integration of food literacy in the constant educational offers of the kindergarten, e.g. lessons given by an external professional.

Challenges:

- Families originate from 18 different nations (different languages, cultures, standards of education)
- Language problems in communicating with the kitchen staff
- Interior design of the new dining room, e.g. different sized furniture, acoustic insulation
- Implementing a database of recipes

Project Results and Evaluation:

- Development of recommendations for the fields mentioned above (see paragraph "Project aim"). In this context it should be emphasised that apart from the project implementer, the mentioned team was involved in this process. Because of this involvement, it is assumed that the recommendations will be implemented successfully.
- The different methods of analysing the situation (mentioned above) enabled the project implementer to develop appropriate recommendations.

Recommendations and Conclusions:

- The project approach and part of the recommendations can be adopted by other day care facilities, but it depends on the given conditions (e.g. availability

of a room that can be used as dining room, number of children, financial resources, qualified kitchen staff).

- The database of recipes can be adopted, but have to be adapted to given conditions, e.g. cultural factors like “halal” or different allergies
- It is important to use easy, plain, everyday rules and pictures, in particular when different nations and cultures are involved (e.g. hygiene rules by WHO).
- All measures should be adapted to the given conditions (e.g. the content of the booklet for the parents).
- The target of the project, to develop recommendations, is accomplished. The project approach can be recommended, but should always be adapted to the given conditions.
- It is essential that the head of the kindergarten is committed to the project and that all stakeholders are involved.
- The assistance of an external specialist (e. g. Kindergarten Nutrition Scientist / Kindergarten-Oecotrophologe) could be recommended as a „standard of practice“.

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Best Practice Example of Early Childhood Education in the Field of Nutrition in Latvia

Name of Organisation/Project Implementer:

Latvian preschool educational institutions (PEI)

Project Aim:

- Municipalities make contracts with catering companies in which not the quality of catering, but the lowest price is targeted. The companies offer too low prices quite often for the purpose of winning a tender, which leads to the following situation:
- To make profit (catering business at PEI and schools does not provide large profit), the cheapest food products, which are most often least valuable and not appropriate for children's nutrition, are purchased;
- Menus do not ensure a sufficient nutritional value and also a sufficient quantity of food (sense of fullness), children often feel hungry, health problems arise;
- Mealtimes are subject to the needs of employees (for instance, mid-afternoon meals are served at 3 p.m. or even earlier so that the catering employees can finish their job, but lunch is usually served from 12 noon to 1 p.m.).

The aim is to improve the legislation and control catering services for children at preschool educational institutions in Latvia.

Project Target Group:

Catering enterprises of preschool educational institutions

Project Stakeholders:

Kindergarten, parents, children, Ministry of Education, Ministry of Health, Ministry of Welfare

Project Description/Approach:

- In August 2001, the «Recommended Portions of Energy and Nutrients for Latvian Inhabitants» were set by the government, and putting in order the catering of children and pupils was set as the first priority;
- Along with setting these recommended portions, a methodology was elaborated for making balanced menus – Nutrition Part IV – Complex Menus which was published in January 2002 and is available for practical use;
- Since 2001, regular practical trainings of employees are held at the Local Governments Training Centre of Latvia regarding the organisation of catering of children and pupils;
- In 2007, a handbook «Organisation of Catering at Schools and PEI» - Parts 1 and 2 were written and published by engaging several lecturers of the Department of Nutrition, Latvia University of Agriculture;

- In 2007, the Department of Education, Youth and Sport of the Council of Riga requested the elaboration of criteria for the quality of catering at PIE, and these criteria were accepted in 2008; the criteria are into force and meeting them is controlled;
- In the end of 2010, the Association of Providers of Catering for Educational Institutions, the goal and task of which is to ensure optimal catering at PIE and schools, was founded.
- The Latvian Ministry of Health elaborated a draft of the Public Health Guidelines 2011-2017 in which a chapter on lifestyles and food habits is included. Tasks of the Guidelines:
 - to develop amendments for legislative acts to ban the advertisements of unhealthy food products;
 - to amend the Latvian Law on Lotteries of Goods and Services, so that it bans selling unhealthy foods together with toys or promoting these foods by offering lotteries, prizes, or other benefits

Challenges:

- The public is not well informed
- The government does not coordinate activities for families => for parents – lectures, activities, informative materials etc.
- Lack of national level studies on the diets of preschool age children
- Non-motivating wages in catering companies – low quality services

Results:

- The kindergarten manager is responsible for organising catering at kindergartens. A separate room for cooking food, a room for serving food, and a room for washing and storing dishware is available at any kindergarten.
- A menu, based on the principles of healthy nutrition for corresponding age groups, is made for at least 2 weeks (at some kindergartens, even for a month).
- A catering enterprise coordinates the menu with a medical nurse of the kindergarten who is a staff member at any kindergarten. The menu is available at a visible place, so that the parents can get familiarised with it. Serving meals is provided according to the menu which is balanced for each age group.
- All dishes are cooked at kindergartens on the spot (delivery of cooked food and ready-to-cook food is not allowed).
- Before serving a dish, it is tested (tasted) by the medical nurse. A sample of each dish is stored for 24 hours.
- At municipal kindergartens, parents pay only for meals. For low income families, the cost of meals is covered from the municipality's budget.
- The working hours of kindergartens are from 7.00 a.m. to 7.00 p.m.; three meals are provided during this period.

- The following foods are not allowed at preschool educational institutions:
 - beverages to which food colourings, sweeteners, preservatives, caffeine, amino acids are added
 - sugar-based confectionery (candies, caramels, sugarplums)
 - chewing gums
 - foods containing 1.25 g of salt or more

Recommendations and Conclusions:

- To offer meals to a child at certain times.
- Not to substitute a meal with sweets
- To diversify the menu of children every day. To let children eat their meal slowly, together with their family or friends
- To make breakfast the most important meal a day
- To provide every meal with a dish containing complex carbohydrates
- To provide the everyday diet of children with products rich in proteins, minerals, vitamins
- To provide the necessary amount of calcium from milk and milk products in children's diet
- To offer children fruits and vegetables, especially domestic ones, in every meal, and to diversify their assortment
- To use fats moderately when preparing food for children
- To ensure that fruits, vegetables, and nuts are available to children between meal times
- To ensure that children drink enough liquids every day

Best Practice Example of Early Childhood Education in the Field of Nutrition in Romania

Project Name - CHANCE (Community Health Management to Enhance Behaviour). Improving the health behaviour of preschool children through kindergarten and families in Dumbravita, Romania

Project Aim:

Romania is well known for its “abundant” but unhealthy diet, for its sedentary lifestyle, and for the lack of preventive health behaviour. Unhealthy eating habits have been maintained for many years and we observed that these patterns are very slow to change. To support these statements we can point to the high number of deaths caused by cardiovascular diseases, to which unhealthy eating habits make a major contribution. We also observed the high number of children with nutrition deficiencies: iodine, calcium, vitamin D and nutrition related illnesses as obesity or diabetes.

In Romania, the consumer health education domain is in need of a variety of approaches which will have more marked and longer-term effects on society. It must start in early childhood with a consensus effort made in the kindergarten by educators and at home by parents.

Project Target Group:

Preschool children living in a bounded area (community), Dumbravita near Timisoara and grandparents

Project Stakeholders:

Local authorities, school representatives, church representatives in Dumbravita

Project Description/Approach:

The project involved ten partners from six countries: Germany, Great Britain, Sweden, Austria, Latvia and Romania. It was financed by the European Union and covered a period of two years (2007-2009). The starting point of this project was the idea that the local community to which a person belongs is able to influence their level of knowledge regarding a healthy lifestyle and its implementation in everyday life and also the idea that children eat what their parents and grandparents give them to eat. This way parents and grandparents are those responsible for children’s eating behaviour.

The project focused especially on at-risk populations, disadvantaged social groups such as the preschool children, which presented an increased need for support. The idea behind choosing these groups was that through the stimulation of participation and motivation, they will become better integrated and healthier.

As intervention methods we used meeting with children where we emphasised the importance of fruit and vegetable consumption by reading, poems and songs on this topic. We helped children to build different animals using fruits and vegetables

(hedgehog, ladybird, frog, sheep). To develop a healthy lifestyle we also promoted sports activities by organizing sports competitions in the kindergarten.

At the end of the project 2 working guides were developed: one explaining how to develop a local network and one explaining how to initiate a community health management system.

Challenges:

Our most important challenge was to motivate people to participate to the intervention meetings and to highlight the importance of a healthy life style.

Project Results and Evaluation:

The programme was successful and had a great impact on the community.

As a result of the intervention programme some teachers from the local kindergarten introduced a few topics concerning healthy behaviour and nutrition into their curricula. In addition, the daily menu in the kindergarten was reorganised to take account of information received during the programme. The success of this intervention programme underlines its importance and also suggests how relevant such programmes are for local communities in Romania.

Recommendations and Conclusions:

- Due to the guides that were elaborated, local authorities should find easy to implement this project and the best practice that are suitable in their community.
- Information should be comprehensible for every person.
- We found out that it's easy to reach children by their grandparents: if they cook for the entire family respecting the rules of a healthy nutrition, children will grow up healthy and will develop healthy eating behaviours. The health of children can be a motivating factor also for elderly.
- It would be useful a better involvement of physicians in the process. Also the intervention program should be as practical as possible, by creating events to bring people together and create networks.

Best Practice Example of Early Childhood Education in the Field of Nutrition in Turkey

Project Name - “The Effect of Nutrition Education Programme on Children’s Knowledge and Behaviour of Nutrition that was applied to 6 Year-Old Children

Name of Organisation/ Project Implementer:

Selcuk University / Vocational Education Faculty

Project Aim:

The aim of the study is to investigate the effect of applied nutrition education on six-year old preschool children’s nutrition related knowledge and behaviour acquisition at basic level.

Project Target Group:

Six years old kindergarten children

Project Stakeholders:

Parents and teachers

Project Description/ Approach:

The study was conducted in 2006 at two stages as intervention and follow-up. The intervention study was executed on a total of 94 children (48 of them were experimental group and 46 of them were control group) three different kindergartens of private primary schools in Konya city centre. The nutrition education program, which is used by the United States Department of Agriculture, Food and Nutrition Service in its nutrition education researches, was applied to the experimental group children for a period of seven weeks and activities used in the program were prepared with guidance of Nutrition Education Activities Set that was built up by Mayfield (2002). The follow-up study, the state of the permanence of the intervention was given to students through applied nutrition education. The permanence of childrens' nutritional knowledge was determined via "Nutritional Knowledge Test". Also, childrens' anthropometric measurements were taken. Nutrition education activities were integrated into sensory development, language arts, science, dramatic play, art and music by researchers.

Challenges:

To find some extra time for intervention program in the scheduled time tables at schools was the most significant challenge encountered in implementing the project, however the need and interest of the parents and teachers in nutrition helped us overcome it.

Project Results and Evaluation:

Results: It was found that there was an increase in the knowledge of the children in the intervention group about food pyramid, food groups and foods that should be frequently or rarely eaten. As a result of the follow-up program, a decrease was observed in the matching points of the proteins and their resources with the carbohydrates and their resources and no such change was observed in their matching of vitamin, mineral and sources, which may suggest that permanence was achieved.

Measure: The effectiveness of the study was tested via the comparison of pre-tests and post-tests as well as the comparison of the intervention post-tests, permanence tests and the follow-up study that was held 10 months later. The instruments were Nutrition Knowledge Test and Nutrition Behaviour Questionnaire.

Success: Inter disciplinary coordination between Nutrition and Early Childhood Education, parent participation, and support by school and teachers are the factors that played a significant role in the success of the study.

Recommendations and Conclusions:

- It would be more functional to take into consideration the socio-economic, cultural and religious background of the country and its common nutrition practices and problems when devising the intervention program which will be used in program activities.
- The needs analysis should be made to determine the needs and the interests of of the group who will be involved in the Intervention program.
- The Intervention program should observe the needs and and the interests of the group.
- Integration of children, families, and kindergarten teachers and administrator is very crucial.
- To create awareness in stakeholder is important.
- Hands on activities were appropriate for nutrition education.
- The intervention period needs more time than seven weeks
- Compulsory nutrition education activities integrated into preschool curriculum are believed to be useful in forming and developing awareness and attitudes.

The guidebook gives an overview of best practice examples of participating countries that have been successful in practice. For comments and additional information, see the addresses of the project implementers at the end of the guidebook in Annex 1.

Conclusion

As the results of this project show, nutrition in early childhood is very important for public health. Therefore, the potential of nutrition should be used more intensively in early childhood. However, project outcomes demonstrate that the subject “nutrition” is to less present in the curricula of kindergarten teachers – the most important multipliers - in all participating countries. The strength of this project is the cooperation of participants of countries who had already developed clear strategies and already started to implement effective food and nutrition education programs and countries who are at the beginning of this process. It is of especially value that due to intensive exchange and deep discussions from different perspectives, learned from each other. The participation of stakeholders in all different project phases is characteristic and is a key point of success. Thus, various stakeholders within the setting kindergarten have been considered in each country. To reflect the results of the project to the stakeholders a comprehensive nutrition guidebook for early childhood active stakeholders has been developed. The application-oriented guidebook established in this project and implemented in different programs/strategies should be evaluated in near future to show how the proposed interventions reach the target groups and to consider what size of effect is possible. Therefore, the next step should be to learn from the implementation of the programs. Further studies should evaluate the impact of the nutrition guidebook in the setting kindergarten. Within a major sample it has to be examined if the established nutrition guidebook is helpful for stakeholders and if the implementation of the nutrition guidebook contributes to a sustainable nutrition education in early childhood which is outstanding for future health.

Annex 1. Contact Address

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