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SHORT COMMUNICATION

FACTORS IMPACTING THE PREPARATION OF SPECIAL DIET MEALS IN PRE-SCHOOLS OF RIGA

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Abstract

The needs of children for health and growth, and avoidance of allergies and intolerances require attention and involvement. Based on national regulation, pre-schools should provide a wholesome diet for children, including children with special diet recommendations by doctor. A child`s disability to eat regular pre-school meal propose to look for specific substitutions. There are needs for various menus in pre-schools which should be introduced additionally to the main menu. For providing special diets, pre-school canteens have to prepare separate meals for small groups of children using a limited number of products. Preparation of various menus may imply complexity of technological processes, needs for specific training, costs, and investments for additional equipment. The aim of this study was to evaluate the factors which affect the preparation of special diet meals on the physical and social environment of pre-schools. To achieve the aim, the following objectives were set: 1) to define and analyse factors implementing preparation of special diet meals in pre-schools; 2) to examine the relationship between the demand the special diet meals and additional resources. Quantitative research methods including primary data collection using online survey were applied. A total of 136 pre-schools in Riga filled out the questionnaire, including 121 pre-schools which have children with food allergies or intolerances. The results showed that the three major groups of internal factors affecting the preparation of special diet meals were personnel, physical environment and production capacity. The impact of each factors' value and features should be evaluated in further studies that would allow to solve the problems of providing special diet meals in pre-schools.

Keywords: special diet, pre-school, production factor

Introduction

In pre-school educational institutions, children spend most of the day (8–10 hours on average) where they receive three meals that form 70–80% of daily nutrient and energy consumption. In Latvia, Cabinet Regulation No. 172 "Regulations regarding nutritional norms for educates of educational institutions, clients of social care and social rehabilitation institutions and patients of medical treatment institutions" (2012) (hereinafter, Cabinet Regulation No. 172) states that children in educational institutions should receive a healthy and balanced diet made of natural products on the day of serving a dish. Therefore, pre-schools represent a wholesome opportunity to impact children's nutrition. The requirement described within Cabinet Regulation No. 172 also applies to children who have a diagnosis confirmed by the doctor (such as celiac disease, food allergy or intolerance) that requires nutritional correction – adequate nutrition should be ensured to the child in accordance with written instructions of the medical practitioner, but at the same time all nutrient norms that comply with the child's age should be followed.

The children's needs for health and growth, and for avoidance of allergies and intolerances require attention and involvement. Child`s disability to eat regular pre-school meals propose to look for specific substitutions and sometimes additional equipment (Accommodating Children .., 2001). Pre-schools should be able to provide organizational capacity of any human, materials, and economic resources in order to produce healthy food appropriate for children, which children would like to eat. It includes a clear understanding of the director, properly trained and experienced personnel, appropriate equipment and facilities as well as a sufficient budget (Lovelock, Wirtz, 2007).

Production factors are very important in the activity of production companies: human resources and means of production for means of labour (buildings, equipment, tools) and labour items (materials and raw materials), as well as technologies that include the combination of these factors. The use of the means of production in catering company mainly serves for the implementation of functional tasks – they form internal environment for the implementation of the planned production processes (raw material storage, processing, cooking, serving out, etc.). The necessity of the means of production is closely related to production capacity and load in the company (Millere, Medne, 2007). Production capacity in manufacturing companies can be expressed by consumers' norms of the means of production, which specify necessary production area, the necessity of technological equipment and other means of labour for production of certain volume of production (Clayton, 2007). One of the main criteria for the implementation of a basic activity of catering companies is providing the appropriate production area for the set tasks (Boss, 2007).

Technological, economic, social and environmental factors in food preparation and storage introduced significant changes. Pre-school catering companies face a number of technical, organizational and economic problems. If they need to provide several special diet meals in addition to the main menu. A great number of pre-schools have been projected 20–30 years ago, thus production premises for food processing are narrow, equipment is out of date, and often the employees do not have enough knowledge about food and the latest technologies.

Therefore, the aim of this study was to evaluate the factors, which affect the preparation of special diet meals on the physical and social environment of pre-schools.

To achieve the aim, the following objectives were set:

1) to define and analyse factors implementing preparation of special diets meals in pre-schools;

2) to examine the relationship between the demand of special diet meals and additional resources.

Systematic approach for the settlement of problems allows to determine totality of affecting factors and their relation. All factors can be grouped into factors of internal and external environment. The factors of external environment include regulations – the requirement to provide food according to each child's specific needs in an educational institution. Whereas totality of the factors affecting internal environment is determined by physical resources – technological facilities (equipment, inventory), staff availability (staff` knowledge, skills, attitudes), as well as child allergies (Otten et al., 2017).

Materials and Methods

All municipality pre-schools (186) in Riga were invited to take part in a survey via e-mail in January of 2017. Survey included nine open type questions and had two-parts:

1) participants were instructed to apply a variety of food restrictions that might affect development of specific diet meals for pre-school aged children (1.5–6.0 years), e.g., number of children with diets, number of diet types, based on the most common products identified by the children`s doctors,

2) questions about core factors that affect the ability to provide the special diet requirements at the pre-school canteens, e.g. staff and technical supply were included.

A total of 136 pre-schools (represented by their nurses and directors) with 20515 children aged 1.5 to 6 years were recruited to participate in the study from January to May 2017. Participants represented the maximum variation sampling for analysis variety of diet and factors affecting the preparation of special diet meal in Riga's pre-schools.

Results and Discussion

The results showed that children have food allergies or intolerances in 120 (88%) out of 136 pre-schools studied, while 16 pre-schools did not have children with food restrictions. A child could be allergic to any food, but the most common causal foods were cow's milk, eggs, peanuts, wheat, soya, tree nuts, fish and shellfish. These foods account for 90% of all reactions in kids (Wood, 2003). Based on the results, the main allergic product in pre-schools of Riga were dairy produce (384 children), gluten (80 children) and eggs (55 children) (Fig. 1).

A large part of children in surveyed pre-schools were intolerant to several products simultaneously and had an individual diet prescribed, thereby also increasing the share of individual product groups. Food allergies and intolerances to dairy products, eggs, and gluten were most frequently mentioned. Also, allergies to fruits, fish and nuts were mentioned. In many countries, food allergy affects 3% to 6% of children in the developed world (Rona et al., 2007). The primary therapy for food allergy is to avoid the causal food or foods, therefore special (separate) diets for all who have an allergy or food intolerance should be developed.

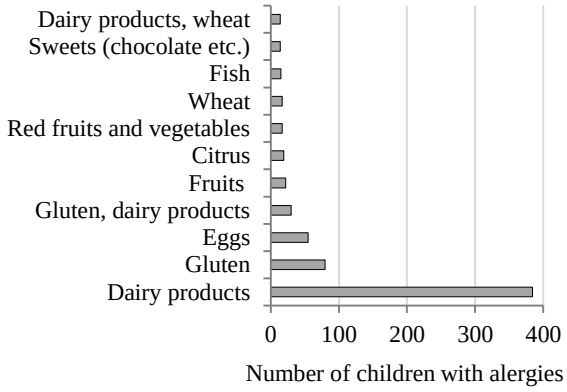

Figure 1. The most common diet types of children who have allergies and intolerances in pre-schools of Riga

The number of children with food allergies or intolerances in pre-schools of Riga is 4.3% on average, but in each pre-school, it varies from 1 to 33 children and they need to be provided with 11 different types of diets (Fig. 2). Whilst 19 pre-schools need to cater for 6–11 different diets, on average pre-schools in Riga municipality need to cater for 3.37 diets, but most need to service only one type of dietary restriction (mode – 1, median – 3) in addition to meal set already existing for children without dietary restrictions.

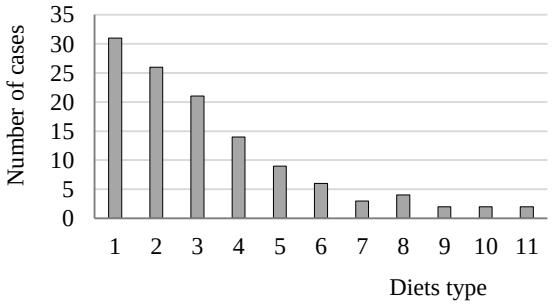

Figure 2. Total number of diets in Riga pre-schools

Regardless of the number of children in the institution, two cooks work in catering departments of pre-school educational institutions in Riga on average (Table 1). The average number of children per institution is 112, therefore, one cook is preparing food for 56 children on average.

Analysing the survey data, we conclude that there is no relationship between the number of diets in the institution and the number of cooks (r=-0.06), because the number of diets is not a predicted value – one institution requires 11 diets, but another institution does not require any special diet.

Table 1

Number of children and cooks in pre-school

Characteristic	Minimum	Maximum	Mean	Mode	Median	St. dev.
Number of children in pre-school	29	678	153.1	112	126	78.607
Number of cooks	1	4	2.04	2	2	0.400
Number of children per cook	10	226	76.88	56	68	34.966

Also, the number of children is variable for each diet, e.g., there are 3 children who need their own diets in the institution and 3 children who need one common diet. In addition, the time during which the diet should be applicable to the child is variable – a 3-month period can be determined during which the child needs the diet. For this reason, planning of the number of cooks cannot be based on data so variable.

As the number of employees involved in cooking is small, often only 2 employees, in pre-school educational institutions, the duties and responsibilities in human resources management should be clearly defined, horizontal hierarchical structure should be provided which allows providing the control function. An important factor in providing the special diet is the employee`s technical competence and experience, professional knowledge that allows the employee to understand the delegated tasks, carry out the planned activities and provide high-quality food production. Another important factor in providing quality products is the employee's responsibility and discipline, but the scope, in which the employee has a right to make decisions, specified by the director, determines the progress and term of execution of work, in which the result will be achieved. The employees involved in the cooking and serving of special diet meals, should have the knowledge on allergens (on product labels) and allergies, and be able to recognize an allergic reaction (Baumgart et al, 2004; Muraro et al., 2010). It is necessary to provide further education courses for the employees in preschool educational institutions at all times during which they acquire theoretical knowledge in order to use them in practice. Studies have shown that older employees in kindergarten have less knowledge on healthy eating compared to younger employees, and the employees with higher education have significantly more knowledge in comparison with those who have a professional education, but further education courses for the employees significantly promote growth of knowledge (Zalewska et al., 2016). It is very important to improve knowledge for nurses, because the doctor determines food restrictions for child with food allergies or intolerances, while pre-school nurses develop the menus for specific diets and make appropriate accommodations. For that reason, the quality of special diets in pre-school depends on nurse knowledge of allowable substitutions or modifications and food preparation technologies, which may promote correct diet for the child. Unfortunately, the nurses in preschool educational institutions do not have enough knowledge about menu development, because qualification of the nurses mostly includes only children's health care issues (Republic of Latvia Cabinet Regulation No. 264, 2017).

Majority of the cooks in preschool educational institutions (72.5%) consider that their knowledge and skills in preparing special diet meals are sufficient. However, the limiting factor in providing menus is insufficiency of equipment and inventory. According to survey data, 38.3% of pre-school educational institutions (among 120) have insufficient technological equipment (mainly stoves, desks) in cases where it is necessary to prepare special diet meals. 26.7% of catering departments in pre-school educational institutions have insufficient kitchen equipment (saucepans, frying-pans, etc.). It should be noted that equipment supply is one of the easiest problems to be solved, but equipment mounting requires funds and sufficient area of premises. The impact of such factors as equipment and premises in particular increases in cases when it is necessary to provide diets for celiac disease and milk protein allergy that requires to comply with strict allergen control instructions. Several conditions should be take into consideration when preparing meals for these diets: 1) to provide specific areas/tables that will be allergen safe; 2) to provide separate storage places, e.g., for gluten-free ingredients; 3) to enforce strict cleaning and sanitation procedures to avoid of cross-contamination – it means using clean tools and food preparation surfaces, avoiding reusing tools and hands that have touched an allergen until they have been washed. This is not possible in catering department of pre-school educational institutions as it is not possible to provide separate workplaces and their equipment, as well as separate employees only for special diet meal preparation. However, pre-school staff must be trained in allergy awareness including preventing cross-contamination during food preparation, recognizing an allergic reaction, reading product labels, identifying hidden allergens, implementing emergency response procedures (Safe at school.., 2012).

Public survey data on the difficulties of food enterprises from the Food and Veterinary Service, which is the controlling operation of food enterprises in Latvia, showed that 13% of enterprises from the total food chain enterprises worked with an inadequate equipment and devices in 2016. Hygiene of the work place is out of control, technological processes itself is not adequate as well (Food and Veterinary..., 2016). It shows insufficient providing of production factors, as the result the quality of food and services will decrease.

We should also not forget about productivity, which is measured by the parameter that is achieved when using a certain quantity of raw materials to produce a certain volume of products (Arora, 2007). If in any pre-school educational institution, 2–3 different menus should be

prepared instead of one meal set, productivity would decrease rapidly. The employees, when preparing diet food, should strictly follow cleaning and sanitation procedures in order to avoid cross-contamination, meaning that kitchen equipment should be changed, food preparation surfaces and equipment should be cleaned, and hands should be washed every time after contact with the allergen (Safe at school.., 2012). Procedures for cooking, storage and presenting food should be developed in order to prevent failures and accidents during storage and serving different diet meals. Internal control systems to prevent food mix up have not been developed in 30.83% of the cases in Riga pre-school educational institutions where diet food is necessary. In institutions where diet food is identified, it is achieved mostly with labelling of inventory and plates.

Conclusions

Evaluating the organization of special diet meal preparation, all the factors should be assessed, including their relationship and interaction. During the study three major groups of internal factors have been identified, which include personnel (number, competence knowledge, experience, attitude); physical environment (premises, inventory, equipment) and production capacity (number of diets, number of children). The impact of value and features of each factor should be evaluated in further studies that would allow to solve the problems of providing special diet meals in pre-schools. Determination and evaluation of factors shows the gap between "what is" and "what should be", allows identifying total field of activities, common points and relation, allows identifying the necessity of additional financial resources and other resources, and in such a way shows the ability of the enterprise to execute basic functions according to consumer demand and food law.

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