

# CURRENT CHALLENGES FACED BY PUBLIC CATERING. PUBLIC CATERING AS A TOOL FOR BEHAVIOURAL EDUCATION WITH A POTENTIAL TO FORM HEALTHIER DIETARY ATTITUDES

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## Summary

**Introduction.** Public catering (also known as mass catering) is an area of nutrition of the population by which the frequency of nutrition-related diseases can be significantly mitigated with the introduction of effective preventive measures. This hypothesis is supported by several studies from all over the world. The analysis of these studies enables a more accurate view on the efficiency of regulative legal measures adopted with regard to public catering.

**Aim.** The aim of this study was to study legal regulations of different countries that are similar to Hungarian Ministerial Decree No. 37/2014 (IV.30) EMMI on the nutritional regulations of public catering, as well as to compare the results of our survey, conducted in order to assess the efficacy of the aforementioned Hungarian legal act, with data concerning nutrition of children from other countries, with the emphasis on Slovakia.

**Material and methods.** The study was conducted between November 2015 and March 2016. 173 Hungarian catering managers, as well as 53 Hungarian and 40 Slovak school children who regularly eat meals provided by public catering, participated in our study. All the participants were selected randomly. We processed and aggregated the data obtained and performed statistical tests, using Microsoft Excel and the R Project software. We compared the menus available in schools to the applicable legal regulations and analysed them, using the NutriCompÉtrend Sport 3.03 (Hungarian version of NutriComp Diet Sport 3.03) software.

**Results.** We discovered that the main factor which influenced the opinion of children on their meals was their taste, but external factors influencing their perception of the meal (such as the appearance of the meal, its taste, general cleanliness, being familiar with the food served, healthiness of the meal and presence of friends) were also important, which was independent from their country of origin. The participating Hungarian children more frequently than Slovak children described their meals as undersalted. Only a small percentage of the participants studied the menu attentively. Energy content and nutritive value of the meals offered by public catering services differed significantly and the analysed menus failed to meet the governmental recommendations accurately in both countries. Energy content and salt content were not consistent with the recommendations in both countries.

Even though the majority (87%) of the public catering service kitchens in Hungary introduced some required technical or technological alterations during the grace period allowed by the Decree No. 37/2014 EMMI, the majority of them (62%) still needed further alterations at the time of the study in order to fully comply with the Decree, as declared by managers of the catering services that participated in our study.

**Conclusions.** One of the most important problem at the time of the study was the need of modernization that should be pursued as soon as possible by the majority of the catering facilities. The taste of meals provided by mass catering is currently far from optimal and, therefore, development in formulation is needed, including introduction of new technologies and new raw materials. The analysis of our results proved that the demand for mass catering services depends on the quality of the food provided and on external factors influencing the perception of the meal, and that there is demand for the development of healthy meals. Complying with the operating law and satisfying the expectations of the consumers are not easy tasks and, therefore, cooperation between all the subjects that contribute to the public catering chain is important. Governmental support is also indispensable.

Keywords: public/mass catering, nutrition-related diseases, prevention, health education, nutrition education

## INTRODUCTION

The frequency of nutrition-related diseases is growing not only in Hungary, but all over the world (1). Various measures have been taken globally in order to preserve health and decrease the frequency of these diseases. Similarly to other European countries, Hungary also strives to increase health consciousness of the citizens, and their activities also involve the promotion of healthy nutrition. The governments and health services are now aware that it is more effective to prevent the diseases, rather than to treat them to restore health (1-3).

Public catering is defined as an organized supply of food for groups of people of different gender, age or occupation. This includes, among others, food supply for children and youths (i.e. kindergartners, pupils, students, boarding school students and children in orphanages), for college and university students, employees, prisoners, homeless persons or people in financial need, patients and residents of social care institutions (4).

Public catering is expected to have a great role in improving public health. Firstly, it should satisfy the energy and nutritive requirements of consumers of different age, gender and physical activity level. Secondly, it should also encourage the consumers to direct themselves towards a more healthy diet. This is to be done by influencing their preferences through promoting the consumption of more nutritious foods and introduction of advanced food processing technologies. The offered meals should fulfil the expectations of consumers in terms of both quality and quantity to the biggest possible extent.

This can be achieved if public catering promotes healthy nutrition both in theory and in practice, making them gradually more accepted by the society. The responsibility of public caterers is the greater, the greater is their variety of consumers they serve and the bigger is the amount of meals served. It is of extreme importance to control what children in social care and educational institutions eat, since health consciousness, dieting behaviours, habits and taste preferences are still formed in these age groups, and habits adopted at an early age will have vast influence on their adult habits and preferences (4, 5).

The arguments noted above are supported by the fact that official programs, nationwide projects and/or governmental regulations have been adopted with the aim of reforming public catering – with special attention paid to the supply of children in schools and elsewhere – in several countries of the world. In table 1, we compare regulations adopted by various European countries to serve different nutritional goals.

To minimize the nutritive and health-related risks associated with public catering, Ministerial Decree No. 37/2014 (IV.30) EMMI was issued. With the exceptions listed in the closing provisions, the Decree was valid from 1<sup>st</sup> January 2015. As its primary aim was to eliminate problems that were revealed by studies related to nutrition, the Decree includes:

- several recommendations concerning the increase of intake of vegetables, fruit, fibre and calcium and the decrease of intake of salt, sugar and saturated fats,
- recommendations on the different food groups used rather than on the nutrients whereby the Decree follows the most recent nutrition-related recommendations,
- recommendations concerning the intake of different food groups for all the ages,
- daily intake recommendations for nutrients,
- list of substances that are forbidden to be used in edibles,
- requirements concerning written warnings that are to be placed on products with high salt content and sweetened beverages,
- requirement for public caterers to post the menu in a well-visible place; the menu should contain salt content and allergenic ingredients of the foods (as well as their energy content, fat, saturated fat, protein, carbohydrate and sugar content, as introduced from 13 April 2017),
- requirement for public caterers to prepare portioning instructions (the volume and size of portions in grams) that are to be placed in a place visible for the servicing personnel,
- recommended daily intake of milk or a dairy product with an adequate amount of calcium, recommended daily intake of vegetables and fruits (at least one portion of unprocessed vegetable or fruit) and recom-

Tab. 1. Recommendations for the intake of certain foods in different European countries (6)

Food	BG	HR	CZ	GB	FIN	F	RO	SLO
Fruits and vegetables	recommended to eat every day	recommended to eat every day	recommended to eat every day	recommended to eat every day	recommended to eat	recommended to eat	recommended to eat	recommended at every meal
Milk and dairy products	recommended to eat every day	recommended to eat every day	recommended to eat every day	recommended to eat every day	recommended to eat	recommended to eat	no recommendations	recommended to eat every day
Constant access to fresh water	recommended	recommended	no recommendations	recommended	recommended	recommended	recommended	recommended
Fish	recommended to eat at least once a week	recommended to eat at least once a week	recommended to eat every day	recommended to eat at least once a week	recommended to eat at least once a week	no recommendations	no recommendations	recommended to eat at least once a week
Deep fried food	recommended to limit to max. twice a week	recommended to limit	no recommendations	recommended to limit to max. twice a week	no requirement	recommended to limit	recommended to limit	recommended to avoid
Sweets and pastry products	recommended to avoid	recommended to limit	no recommendations	recommended to avoid/limit	recommended to limit	recommended to limit	recommended to limit	recommended to avoid
Chips and salted snacks	recommended to avoid	recommended to limit	no recommendations	recommended to avoid/limit	recommended to limit	no recommendations	recommended to limit	recommended to avoid
Beverages	recommended to limit certain beverages	recommended to limit certain beverages	no recommendations	recommended to limit certain beverages	water or skimmed milk are recommended	water is recommended	recommended to limit certain beverages	recommended to limit certain beverages
Salt	recommended to limit	recommended to limit	no recommendations	recommended to limit	recommended to limit	recommended to limit	recommended to limit	recommended to limit

mended daily intake of grain products of food containing grain (at least one portion of a product made of whole grain),

- recommendations on serving dietetic food; a consumer is required to be served dietetic food if it is medically grounded and prescribed.

The Decree has been valid from 1st January 2015 but a grace period was allowed till 1st September 2015 so that the changes could be introduced gradually (7).

In Slovakia, a Decree No. 330/2009 (VII.14) (in Slovak: 330/2009 Ministerstvo školstva Slovenskej republiky) has been in effect from 2009. The Decree regulates public catering in schools. It provides a plan for the elements on menus, restrictions of the content of some raw materials that are allowed and other principles (8). However, the Slovak Ministry of Education issued a statement in 2015,

in which it was underlined that children need even more advanced and healthier nutrition. This resulted in creation of a collection of recipes ("Materiálno – spotrebný normy a receptúry"), which provides high quality meals for respective age groups, with the ingredient list fitted to make 100 portions, preparation procedures and nutritive content per portion. As the compilation is to be economically friendly, it promotes the use of seasonal and local products. Practical instruction concerning portioning is also included, as well as a chart indicating the loss of nutritional substances resulting from peeling, cleaning, and other preparative methods. This collection of recipes is, in our opinion, of great help to the Slovak catering managers. The centrally issued collection of recipes facilitates the supply of quality food and makes every-day work easier for the caterers (9).

**AIM**

In the course of our study, we aimed to review regulations of other countries adopted for food supply that would have the same function as the Decree No. 37/2014 (IV.30) EMMI in Hungary. We also aimed to compare accessible Slovakian data concerning catering for children with the results of our survey in the context of the efficacy of the governmental regulations. We wished to analyse public catering from the dietetic point of view, which we hoped to conclude by determining what further changes in the sector might be necessary. We believe that, after a thorough assessment of the current situation and identification of existing problems, mistakes and shortfalls, effective interventions may be proposed, whereby – and with the aid of further studies – public health may be improved.

**MATERIAL AND METHODS**

To collect the data, we used an original questionnaire consisting a closed list of questions. Additionally, we analysed 20 daily menus in each catering facility. 40 Hungarian and 53 Slovak pupils from junior secondary schools (aged between 10 and 16 years and customers of public catering for more than two years) and 183 Hungarian catering managers volunteered to participate in our study. The study was conducted between November 2015 and March 2016. The survey was in Hungarian, and the data was collected in Hungary as well as in parts of Slovakia where Hungarian is spoken.

We processed and aggregated our data and performed statistical tests using Microsoft Excel and the R Project software. We applied the Fisher’s exact test to analyse the distribution of the answers from the Slovakian and Hungarian group separately. We compared the menus available in schools to the applicable legal regulations and analysed them, using the NutriCompÉtrend Sport 3.03 (Hungarian version of NutriCompDiet Sport 3.03) software.

In addition to that, we analysed the process of planning the menus, quantitative list of ingredients, compliance with the daily intake requirements and maximum daily intake requirements of some substances, and external factors influencing the perception of the meal, including the environment of the catering facilities.

**RESULTS**

The results of or questionnaire, as well as of our analysis of catering facilities, are described below.

66% of the pupils attending included junior secondary schools in Hungary ate meals prepared in school, while the same was true for 51% of their Slovak counterparts. 62% of Hungarian students that ate at school ate only lunch, and 38% of them were provided with three meals a day. In Slovakia, 100% of the students were provided with lunch only, as it is the only option available in Slovakian schools. 81% of the students

surveyed in Hungary had been using public catering for more than two years, while the same was true for 67% of Slovakian participants. Having been using public catering for more than two years enabled the students to evaluate the changes in the quality of service during that period.

**Efficacy of attitudinal education in forming dietary habits**

We examined the efficacy of the educative efforts made with the aim of promoting healthier dietary behaviours. We asked children and youth about their taste preferences, i.e. whether and to what extent they liked the meals that had been introduced after new legal solutions. The children had been taking their meals at school for at least two years. 74% of the Hungarian and 85% of the Slovak children stated that they enjoyed the meals that were new to them (i.e. which they had not known previously). The answers can be seen in table 2. We may state that the time span children had been eating in public catering and the likelihood of trying new kinds of meals are in a close correlation.

The majority of children from Slovakia (78%) and Hungary (91%) always or often eat their whole portion of lunch. We examined the level of satisfaction with the volume of food portions. Our findings are shown in table 3. Most of the children assess the served portions as sufficient and satisfactory. A difference between opinions of boys and girls is visible.

The children were asked to assess their preference towards seven different meals on a scale from 1 to 5, with 1 describing a meal that they did not like at all, and 5 describing a meal that they liked very much. They were also to assess how healthy they think each of the meals were. The results for the two questions are shown in table 4. The results seem to be accurate in reflecting health-related attitude of the children. In both countries, children believed that eating fruits and vegetables is good for health.

Tab. 2. Joining public catering at school and tasting new kinds of meals

School term	Number of Hungarian school children			Number of Slovak school children	
	Yes	No	Total	Yes	No
1 <sup>st</sup> half of 2015/2016	3	1	4	1	1
2014/2015	4	1	5	3	0
2013/2014	1	0	1	7	1
Before 2013	31	12	43	23	4
Total	39	14	53	34	6

Tab. 3. The assessment of the size of the meal, by gender

Portions	Number of Hungarian boys	Number of Hungarian girls	Number of Slovak boys	Number of Slovak girls
Less than enough	6	12	7	0
Enough	18	15	18	10
More than enough	2	0	2	3

Tab. 4. Preference for various kinds of food and belief whether the same kinds of food are advantageous for health

Meals	Mean for Slovak school children		Mean for Hungarian school children
	Preference	Beneficial for health	Preference
Soups	3.1	3.9	3.4
Meals of meat	4.0	4.1	3.9
Meals of fish	3.3	4.1	3.0
Pasta	3.1	4.2	3.5
Egg meals	3.4	3.9	3.0
Meals made of vegetables and fruits	2.5	4.8	2.4
Sweets	4.5	2.4	4.7

The study of children’s opinion on the external factors influencing the perception of the meal was conducted by asking the children to assess seven different factors influencing their perception of the meal: appearance of meals, their taste, general cleanliness, being familiar with foods, healthiness of the meal, the presence of friends. The answers were given on a scale from 1 to 5, with 1 describing a factor that they believed the least important for their perception of the meal, and 5 describing a factor that was of primary importance to them. The results are shown in table 5.

Even though there are some regional gastronomic characteristics that differ between Hungary and Slovakia, no big differences were found between the level of health consciousness of the school children in these countries. The factor that was most important for studied children’s perception of the meal was the meal’s taste, but the healthiness of the meal was also important for both Slovak and Hungarian children. More Hungarian participants (62%) than Slovak participants (41%) be-

Tab. 5. External factors influencing the perception of the meal

Factors	Mean for Slovak school children	Means for Hungarian school children
Appearance of meal	3.6	3.5
Taste of meal	4.2	4.2
General cleanliness	4.1	4.0
Being familiar with the food	3.3	3.6
Healthiness of the meal	4.2	4.4
Presence of friends	3.9	3.2

lieved their meals were undersalted. A small percentage of children paid attention to the menu, they ate what they were given and were not interested what they would eat the next day. On the whole, the perception of reforms implemented in public catering is positive.

**Possibilities for establishing public catering that encourages taking preventive health measures**

We found major differences between the energy content and nutritive content of the meals offered by public caterers and the governmental recommendations. The menus analysed with the NutriCompÉtrend Sport 3.03 Project software failed to meet the recommendations accurately in either country. The energy content in the offered meals was most often too big and occasionally too small, while the salt content was always too big.

No significant differences in the implementation of the requirements of the Decree were found between cities and smaller settlements ( $p > 0.05$ ). 87% of public caterers implemented some technical or technological alterations during the grace period allowed by the Decree. However, the majority of them (62%) needs further alterations in order to fully comply with the Decree, as declared by managers of the catering services that participated in our study. Differences between the re-



gions were found in the adequate adaptation of the catering services. Opportunities of funding seemed to be bigger in Middle Hungary, as it was easier to acquire raw materials for the meals (Yes = 66%, No = 34%). The region of South Transdanubia seemed to have most problems with acquiring varied and healthy raw materials (Yes = 29%, No = 71%). However, Fisher's exact test did not reveal any statistically significant differences between the regions ( $p > 0.05$ ). The limitation of the use of salt seemed most difficult to achieve for public catering services – when asked if the recommended salt content of the meals can be achieved, 94% of the participating catering managers (95% CI 89.63-97.17%) answered negatively, arguing that raw materials obtained from food industry had too high salt content already.

According to 65% of the catering managers, the main cause of the big amount of leftovers is using foods that do not appeal to the consumers. These foods were declared to include vegetables, vegetable purees, fish, and whole grain.

We also aimed to explore whether the amount of leftovers increased after the introduction of the Decree. Negative answer was given by 33% of the caterers (95% CI 26-40%), and positive answer was given by 67% of the participants (95% CI 60-74%). In exact binominal test, positive answers revealed to be represented by more than 55% of the population ( $p < 0.001$ ). Therefore, it can be concluded that the amount of leftovers did increase after the introduction of the Decree.

## DISCUSSION

Although the aim of the ministerial decree on public catering is to procure that the meals offered by public catering become healthier, our research findings indicate that beside securing that raw materials which the decree contemplates such as salt, sugar, meals made with wholly-milled grain, vegetables and fruits and nutrients such as fat and calcium be provided properly and in sufficient quantities it may be problematic for public caterers to obtain sufficient supplies of healthy food stuffs due to insufficient funding and to comply with the requirement indicated by the variety index. We have found that the causes of difficulties are complex and combined efforts would still be needed from both governmental and non-governmental players. One of the problems to be solved is that until regulations are absent which would prescribe the salt content in raw materials supplied by the food industry similarly to the regulations regarding the food served by public caterers the latter can hardly comply with the requirement concerned.

The opinions of the children who participated in our research about the taste of the food they are served

is determined, as we believe, mostly by their eating habits they bring from home. This explains why they frequently tasted the food served at school lacking salt and why they refused to accept vegetables and fruits. Despite the success of certain newly promoted meals and raw materials, the volume of leftover food has still increased nationwide which fact indicates that the kitchens of public caterers still need a lot more developing and improvements.

We believe that flavouring could be improved by sufficient food processing technologies, by using appropriate seasoning and a better selection of raw materials.

In Belgium, a survey was carried out among school children with the aim of learning whether popularity of vegetables and fruit among these consumers could be achieved by placing vegetarian meals onto menus. Although we found significant differences in the volumes of leftover food where the offered meals contained a lot of vegetables and fruits, Keyzer et al. found no significant difference in their 2012 study where more vegetables and fruit were offered compared to units or areas where more traditional meals were served (10).

Our research confirmed our expectation that the longer the period while a consumer uses public catering where it represents a more advanced level of healthy catering the stronger is the chance to a more open attitude to new flavours and food that is prepared through more advanced technologies, in general. We believe that this finding is of key importance since healthy eating habits have a better chance for forming in childhood: eating attitudes take shape for the entire life at a relatively early age.

Raulio et al. actually reached a similar conclusion in Finland. Their survey allowed a conclusion in that food services relate to healthy eating habits since the choices of meal of school children who participate in the catering services at their schools and employees who use the canteens of their place of work are closer to the recommended choices than those of persons who do not utilize such offered services. Their further conclusion is that Finnish public catering contributes to the formation of appropriate eating attitudes among the population as such services offer meals that correspond to their national traditions while they also demonstrate good examples for their consumers with their menu variations that are worth to follow (11).

We believe notwithstanding that further surveys are desirable among schoolchildren in the area as to how public catering menus are put together and new choices of meals are recommended to customers. Our research was meant to serve as a starting point for the improvement of a preventive approach and for further research to be done both domestically and internationally.

## CONCLUSIONS

In 2015, public catering, including catering in schools, was reformed in both Hungary and Slovakia. As hardly one year has passed since the introduction of the amendments in Hungary, and less than a year in Slovakia, the data assessing the effects of the new legal regulation is scarce. More data should be collected in schools, which would help to further improve public catering.

One of the most important problem at the time of the study was the need of modernization that should be pursued as soon as possible by the majority of the catering facilities. The taste of meals provided by mass catering is currently far from optimal and, therefore, development in formulation are needed, including introduction of new technologies and new raw materials. The analysis of our results proved that the demand for mass catering services depends on the quality of the food provided and on external factors influencing the perception of the meal, and that there is a demand for the development of healthy meals. Complying with the operating law and satisfying the expectations of the consumers are not easy tasks and, therefore, cooperation between all the subjects that contribute to the public catering chain is important. Governmental support is also indispensable.

### Conflict of interest

None

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