Personalized Portion: a New Approach in the Future Food Service

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Abstract

The concept of the personalized portion is associated with the amount of food adapted to each person and their needs, the proposal is based on the integration of work environment of companies that collaborate with the contract catering sector. The key points to act and implement in the companies are: the implementation of the nutrition appointments; the development of the database with the information of each employee; the translation of this information for the distribution in macronutrients and grams that, finally, are converted from the image of the employee's "dish" of simple and fast interpretation.

Key words: *Food service, contract catering, employees, sustainability, health and wellbeing*

Anotacija

Personalizuotos mitybos koncepcija siejama su kiekvienam žmogui ir jo poreikiams pritaikytu maisto kiekiu, šios koncepcijos siūlymas grindžiamas darbo aplinkos įmonių, bendradarbiaujančių pagal sutartis su maitinimo sektoriumi, integracija. Pagrindiniai dalykai, kuriuos reikia įgyvendinti įmonėse, yra šie: mitybos planų (receptų) įgyvendinimas; duomenų bazės su informacija apie kiekvieną darbuotoją kūrimas; šios informacijos taikymas nustatant konkrečių makroelementų poreikį gramais, atsižvelgiant į konkrečius kiekvieno asmens poreikius, ir galiausiai greitas ir paprastas personalizuoto patiekalo sukūrimas.

Raktiniai žodžiai: *maitinimo paslaugos, maitinimas pagal sutartį, darbuotojai, tvarumas, sveikata ir gerovė.*

Introduction

The history of food and the history of technology are closely related, since the meal is not only the result of the combination of ingredients, but is also the product of the technologies and processes applied. This experience goes far beyond the adequate consumption of nutrients, as it encompasses social satisfaction and personal integration in the community, being able to overcome expectations, emotions and favourable personal responses in relation to the moment of the meal, increasing its social and individual values. In this way, the food chain appears as an adaptive, complex, multidimensional and multisector system that has to be ensured by an interaction of sectors and process phases (such as production, transformation, distribution, consumption) which develop commercial, financial and social relations between themselves (Kumar et al., 2013; Willett et al., 2019).

Contract catering is the sector of economic activity that covers a wide area of services related to food management, involving the preparation and service of meals, encompassing all places or establishments where food, meals and beverages are prepared and served. Thus, the target audience of contract catering is very heterogeneous, but is characterized by constituting a specific and restricted community, for example: patients, professionals and visitors of hospitals and health establishments; institutions such as nursing homes, day centres and home delivery of meals; public and private educational establishments; prisons; public administration organisations (such as security forces, armed forces, firefighters, ministries and institutes); companies or other private institutions; etc. (Neto, 2020; Wildes, 2007).

In this perspective, contract catering is aware of its responsibility towards public health, which is reflected in strict recommendations, especially in terms of food safety, adequacy and

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nutritional balance of the meals provided. Currently, factors such as supply, food handling, type of offer, culinary preparations, portion sizes adjusted to the characteristics of the group or individual are also taken into account in the evolutionary prism of the catering sector. As indicators of quality in this sector, the satisfaction and acceptability of meals by the customer are often used so meals must respond to the individual characteristics of the consumer and combine the technical-scientific knowledge of nutrition with the culinary practice and the service provided by the sector (Cucurachi et al., 2019; Farahani et al., 2013; Griffith et al., 2010).

Contract catering companies are dedicated to the supply of meals, which support their operation in faithful partnerships with their customers and in the constant evolution of their processes, leading to a unique quality/price binomial in such diverse market segments. The companies' main purposes are to permanently anticipate food and restaurant solutions, through the development of new concepts and methods that guarantee loyalty and market leadership. Its missions are mainly to work in the restaurant sector, with values and principles of innovation and sustainability that surprise its customers, consumers, suppliers, employees and shareholders (Colares et al., 2018; Morgan & Sonnino, 2007).

Recently some goals are proposed in these types of companies, such as: the reduction of plastic and paper; the stimulation and implementation of a healthier and more sustainable diet; the reduction of waste; the reduction of organic waste and the reduction of salt, sugar and fat. It is part of the company's policies to strongly focus on training in order to train employees so that they can respond to the needs and challenges that arise in their daily professional activities. In addition, the companies are primarily focused on customer satisfaction and continuous improvement through innovative and evolving approaches over time (Grech et al., 2020; Leão & Santos, 2012; Neufeld & Cameron, 2012)

The contribution of food consumption in the workplace known permits the identification of bad practices to modify food availability in the work environment, raising consumer awareness for a more balanced food intake. The food intake of employees is constantly considered unbalanced. It is common for employees the desire for a better variety of healthy and fresh foods compared with the existing offerings. According to literature, similarly employees report that the lunch provided by the work canteen is the only opportunity to have a complete meal each day. The concept of personalised option may bring contribution to the improvement of employees' food consumption (J. Lima et al., 2018; J. P. M. Lima et al., 2018, 2021).

Currently, there are an expansive demand for technologies that allow the catering sector to deal with consumer expectations, overcome competition and adapt to the new social, economic and health context, improving the quality of service. The *purpose* of this work is to describe and present the personalized portion software suggestion in a scientific approach to be inserted in a food service working environment. Therefore, proposed below is the description how this food innovation motto was idealized, conceived and constructed.

Research methods

For the development of the initial concept it was essential to verify the status of the technology area at the catering sector. After carrying out a detailed and in-depth bibliographic research in the literature on market analysis and software comparison, no existing software implemented in national and international contract catering companies was found similar to what it is proposed. Therefore, the mindset for this idea has in mind the truth professional catering companies related, raking the principle problems and finding resolutions to solve part of that.

This research proposal was presented as an oral communication on the International Scientific-Practical Conference, "Sustainable Environmental Development: Innovative Technologies" of the Klaipeda State University of Applied Sciences in September 2021. The theme

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fitted on the food service and contract catering industry for the main topics of the conference "Food Technologies and Nutrition's Innovation" and "Innovative Technologies for Improving Human Health" and was presented on the Parallel Session, "Food Technologies and Nutrition".

For the writing of this scientific article, original articles and reviews articles were searched and analysed in scientific databases such as *ScienceDirect* and *Pubmed*. Keywords such as "Food service" OR "Contract catering" AND "Employees" AND "Sustainability" AND "Health and wellbeing" were used. For scientific research, recent and most cited papers were valued on the topic in question. The cited articles are mentioned over the text, mostly on the introduction and part of the discussion, they are available on the bibliography of this article.

The elaboration of this article was carried out to introduce this innovative approach of the food service in a scientific way. The discussion is mainly the explanation step by step of what is needed to implement this software at the contract catering sector. So, the aggregated and adapted information in this article aims to bring the modernization in food services promoting similar personalized portion approaches.

Results and discussion

In the future, food and its entire sector will encompass concepts of access, health and sustainability, since food itself constitutes an essential pillar of social sustainability, insofar as it guarantees the integrity and candid functioning of the individual, in addition to the economic costs, ethical, social and environmental costs intrinsic to society. The tools analysed and developed perform functions inherent to the nutritional quality of meals along with the promotion of healthy eating, ensuring the necessary space for the freedom of choice of the citizen as a consumer, adapting to the needs and individualizing the meal doses for each one (Godfray, Beddington, et al., 2010; Godfray, Crute, et al., 2010; Martinelli & Cavalli, 2019).

The contract catering sector is strongly characterized by the food waste underlying the entire food chain, often related to preferences, consumer affinity for food and meal, as well as their nutritional needs. Situations such as the disproportion of food served in canteens, given the needs of consumers, result not only in food waste, but also in food expenses that can be avoided. Ideally, nutrition services could adopt the personalized portion system, in order to respond to this need identified by the contract catering, meeting the nutritional needs of each consumer, but also giving preference to certain foodstuffs that constitute the frequent daily meal (Engström & Carlsson-Kanyama, 2004; Poore & Nemecek, 2018).

As a contextualization of the problems found, in order to guarantee the needs and requirements of contract catering, the food sector is constantly challenged to innovate, implementing new meal production processes, which provide the reduction of associated costs, food safety problems and low productivity of the sector. Regarding the meal production system, it is designated as a service where large amounts of food are provided for individual consumption, which are subject to different preparations, determining technological innovations that involve everything from equipment to production and management processes (Gheewala et al., 2020; Powell et al., 2011; Wilkins et al., 2010)

The innovations admitted by this sector depend on companies and specialized organizations that can develop these activities, allowing technological advancement. However, for the most part, this technological evolution does not take place in the food sector, since there is no support for individual development. In this way, the strategic implementation of information and communication technologies for the food service contributes to supporting financial management, through a strong commitment to investment, which must be capitalized on the acquisition of advanced technology, employee training and research, guaranteed by quality, dynamics and budgetary control (Gregoire & Theis, 2015; Henderson, 2004; Maynard et al., 2020).

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The concept of a personalized portion is associated with the amount of food adapted to each person and their needs, that is, only what is considered to be the recommended dose and adequate to the needs of each individual are served, making the individual meal experience a personalized act. Ensuring a personalized response to individual needs and characteristics, not forgetting the extrinsic factors to the individual such as the influence of environmental and social factors, providing the meal experience something individual, but promoting the conviviality and collectivist spirit (Martinelli & Cavalli, 2019; The Eat-Lancet Commission, 2019)

Ideally, the proposal is based on the integration of companies that collaborate with the contract catering sector. Thus, all benefit from the support of at least one dietitian who starts his activities as a health professional with the implementation of nutrition appointments for each of the employees. At an early stage, in order to understand individual needs and preferences well as the nutritional status of the employee in question. After this collection of relevant information, the main objective is to provide balanced and adequate meals for each one, implementing a personalized portion system in the company (Gregoire & Theis, 2015; Yona et al., 2020)

The dietitian is a health professional with a leading role in terms of guidance and surveillance of nutrition and food, intervening in several areas (for example, adequacy, quality and safety). The primary objective is health promotion and disease prevention. During the academic training, the future dietitian acquires theoretical and practical skills that provide essential knowledge to know how to transform them into food and meals. In view of the complexity of this action, the dietitian must have skills, in addition to nutrition, which become essential in this sector, such as the management of material and human resources, decision-making, leadership, communication and training, customer satisfaction, planning safe, healthy, tasty and sustainable menus including for specific nutritional prescriptions (The Academy Quality Management Committee and Scope of Practice Subcommittee of the Quality Management Committee, 2013; Yona et al., 2020).

The role designed for dietitians in this intervention are considered extremely important, as well as their relationship with food handlers and company employees, in order to increase the nutritional knowledge and literacy of all stakeholders, promote health and prevent inappropriate eating habits. Initially, it is created and developed by a multidisciplinary team, made up of dietitians, computer engineers, cooks and food handlers. With the elaboration of a database containing the results obtained with the nutrition appointments, it is crucial to establish a link between the dietitian and the food handlers to enhance or improve procedures and processes that were benefit the final product and consequently the final customer (Colares et al., 2018).

For the software development one of the purposes in the dietitian appointment is to distribute the macronutrients of the meal and convert them into grams and later translate them into an illustrative image of the dish to be served to a particular employee. This illustrative image is, therefore, the conversion of the portions to be provided into a "plate" of simple and quick interpretation, so that food handlers can serve a balanced and adequate meal to each employee.

In short, the key points to act or implement in the companies are: the implementation of the nutrition appointments; the development of the database with the information of each employee; the translation of this information for the distribution in macronutrients and grams that, finally, are converted from the image of the "dish" of simple and fast interpretation. In order to facilitate the work and implementation of the proposal in the long term, the specifications and technical files are re-evaluated month by month, preparing the menus monthly according to the needs and taking into account the data collected in consultation, trying to make a final summation of the preferences of each individual.

The importance of the relationship between the dietitian and the food handler and the implementation of the database system is highlighted. In addition, it is also necessary to establish a link between employee and food handler, so that when serving the meal to a particular employee, the food handler knows who the employee is and what is his ideal portion, in order to guarantee the

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correct supply and distribution of food and nutrients on the plate - personalized portion. Thus, together with the IT staff, it is necessary to develop a personalized QR code, that is, a personal code with the data and adequate portions of each individual, developed in an app that each employee have on their personal mobile phone. The summary of the activities needed to promote the personalized portion system is listed below (Table 1).

Table 1. *Framework of activities carried out within the personalized portion approach*
Lentelė 1. Veiklos, vykdomos taikant individualizuotos mitybos metodą, sistema.

Areas	Nutrition	Appointment
		Diet plan
		Portions
	Computing	Data base
		App
		QR code
	Training	Food handlers
		Employees

When implementing the personalized dose program, human, financial, information and material resources are required in order to overcome future challenges. Therefore, it is necessary: dietitians, computer engineers, food handlers, cooks, trainers, workers and all beneficiaries of the approach. In terms of financial and material resources, it is necessary for companies to invest in the development and implementation of new personalized portion practices. In regard to information resources, it is need to sensitize all stakeholders to the optimal development and integration of the company's new ideologies, thus contributing to an implementation based on technical-scientific knowledge, putting theory into practice in the field of action (Neto, 2020).

However, it is important to be aware of the limitations, obstacles and challenges that may delay the development and implementation of these ideologies and new practices. Initially, the lack of an adjusted and adequate planning for the company, taking into account the entire logistics process, from the infrastructure to its employees and collaborators. In addition to this initial stage of organisation and planning, the control of the actions carried out may also fail in its poor compliance with the verification of the activities implemented, as well as in the improvement of all processes in the long term, not contributing to a positive evolution of the implemented system (Gheewala et al., 2020; Grech et al., 2020).

With regard to the concept of the personalized portion approach, from the moment of the nutrition appointment to the computer system and app, as well as the low literacy of the employees and the poor service of the employees in the cafeteria, they may cause reactions of little adherence and poor collaboration with the new system to be implemented. At the level of the computer system, several problems may arise either in terms of the development of the database as with the app itself, or in the entire server that will support the platform.

Taking into account all the logistics, from consultation to data transformation and analysis, obstacles may arise that may not be properly addressed by the responsible. Given this situation and the possible development of this system, it is necessary to always keep in mind the poor training and reduced nutritional literacy of several employees, which may reduce the process and the productivity of actions, requiring their adequate training and awareness to optimize the integration of this system (J. P. M. Lima et al., 2018).

Through the implementation of the personalized portion method, improvements are expected in a medium to long term time horizon. Therefore, the expected results are above all to improve the offer aimed at each employee, that is, individually guaranteeing adequate energy and nutritional needs, increasing satisfaction and the food and nutritional quality of the meal served (J. P. M. Lima et al., 2021).

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In addition to individual results, secondary results are also expected derived from the adherence and active participation of employees, being above all the reduction of food waste, both in terms of leftovers as well as the preparation and cooking itself, optimizing profits and managing properly all food handling processes. In this way, results are optimized in personal, social and economic terms, highlighting the improvement of the nutritional profile of employees, thus contributing to companies with healthier and more satisfied employees (J. Lima et al., 2018; Poore & Nemecek, 2018).

Conclusions

With the accomplishment of this approach, it can be concluded that the implementation of a strategy implies changes in the company as well as the receptivity of all the interested parties. Thus, the company's management is considered an important part of this implementation, since it is part of its functions to coordinate and plan all projects to be developed in the business environment. It is important to show the benefits and challenges of this innovation before implementation.

In addition, awareness is required in the view of the investment that will be necessary, but which in the long term will generate profits, contributing beneficially to the health and nutritional status of its employees. Thus, it is expected that the strategy will begin to be outlined and implemented and that the expected results will be verified in the long term with the monitoring of employees by the dietitian and improvement of results.

Therefore, this innovative practice focuses on two fundamental points nowadays: health and sustainability. When the two points are merged at the work environment, it is a suitable place for the modernization of the food service as it is known today. So, it is essential further research in the food sector to consider eventual variation of the food service and in the contract catering industry that too extends beyond the work context.

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Personalizuota mityba: naujas požiūris į ateities maitinimo paslaugą

(Gauta 2022 m. kovo mėn.; atiduota spaudai 2022 m. kovo mėn.; prieiga internete nuo 2022 m. gegužės 6 d.)

Santrauka

Įvadas. Maitinimas pagal sutartį – tai ekonominės veiklos sektorius, apimantis plačią su maisto tvarkymu susijusių paslaugų sritį, įskaitant patiekalų ruošimą ir patiekimą visose vietose ar įstaigose, kuriose gaminamas ir

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patiekiamas maistas, patiekalai ir gėrimai. Maitinimo pagal sutartį sektoriui būdingas maisto švaistymas visoje maisto tiekimo grandinėje, dažnai susijęs su asmens pageidavimais, valgymo įpročiais ir mitybos poreikiais.

Tikslas – apibūdinti ir moksliškai pagrįsti personalizuotos mitybos programinės įrangos pasiūlymą maitinimo paslaugas teikiančioms įmonėms.

Metodika. Šiam moksliniam straipsniui rašyti buvo ieškoma originalių ir apžvalginių straipsnių ScienceDirect ir Pubmed mokslinėse duomenų bazėse. Paieškai atlikti buvo vartojami tokie raktiniai žodžiai: maisto tiekimas; maitinimas pagal sutartį; darbuotojai; tvarumas; sveikata ir gerovė.

Rezultatai. Pagrindiniai dalykai, kuriuos reikia įgyvendinti įmonėse, yra šie: mitybos planų (receptų) įgyvendinimas; duomenų bazės su informacija apie kiekvieną darbuotoją kūrimas; šios informacijos taikymas nustatant konkrečių makroelementų poreikį gramais, atsižvelgiant į konkrečius kiekvieno asmens poreikius, ir galiausiai greitas ir paprastas personalizuoto patiekalo sukūrimas. Kuriant duomenų bazę, kurioje būtų pateikiami mitybos plano įgyvendinimo rezultatai, labai svarbu užmegzti ryšį tarp dietisto ir maisto tvarkytojų, siekiant sustiprinti arba patobulinti procedūras ir procesus, kurie būtų naudingi galutiniam produktui, taigi ir galutiniam vartotojui. Įgyvendinant personalizuotos mitybos programą, būsimiems iššūkiams įveikti prireiks žmogiškųjų, finansinių, informacinių ir materialiųjų išteklių.

Išvada. Svarbu žinoti apie būtinas investicijas, kurios ilgainiui duos pelno ir teigiamai paveiks darbuotojų sveikatą ir mitybą. Taigi tikimasi, kad strategijos metmenys bus parengti, ji bus pradėta įgyvendinti, o laukiami rezultatai bus patikrinti ilgalaikėje perspektyvoje dietistui stebint darbuotojus ir gerinant rezultatus.

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