



Dietary Aspects of Type 2 Diabetes with Particular Reference to the Potential of Gastronomy

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ABSTRACT

Nowadays, many chronic diseases, such as obesity, type 2 diabetes mellitus, cardiovascular diseases, high-blood pressure, digestive disorders, stress, metabolic syndrome etc appear on a global scale as a result of poor lifestyles. Currently, diabetes, which is known as silent killer, has affected the developing as well as developed nations of the world. The disease was responsible for around 462 million cases and over 1 million deaths in 2017. The present manuscript focuses mostly on the nutritional recommendations that can be used as part of therapy in type 2 diabetes. In addition to the theoretical background, we prepare practical dishes (smoothie and muesli with stevia; plant-based drink and muesli with stevia; vegetable-chicken ragout with whole grain pasta; broccoli-cream soup; sandwich variations) and present it with the help of gastronomy. In the cases presented, we determine the amounts of food ingredients/ one person and energy, protein, fat, and carbohydrate values as well. We hope that the manuscript will certainly contribute to the professional development of those interested and also to the protection of health as well.

KEYWORDS: Type 2 diabetes, special diet, gastronomy, healthy lifestyle, nutritional recommendations

Introduction

Chronic diseases are playing an increasing role in mortality at the global level. In addition, the COVID-19 pandemic is even more dangerous for those suffering from them. Chronic diseases that are prevalent globally include lifestyle-related diseases, such as obesity, type 2 diabetes and others. Diabetes is a non-communicable disease that is one of the major causes of morbidity and mortality in the world. Treating type 2 diabetes at a global level is a significant burden on health promotion organizations and hospitals. In contrast to type 1, it develops primarily due to lifestyle features. Such factors include poor eating habits (excessive sugar consumption), lack of exercise, and a stressful lifestyle [1-4]. Furthermore, obesity, co-morbid high cholesterol and hypertension, and age-related characteristics increase the risk of developing type 2 diabetes [5-6]. The primary goal of our manuscript is to make dietary recommendations for people with type 2 diabetes by analyzing major food groups. After that, we apply the theoretical suggestions in practice. Therefore, we prepare and present dishes that greatly contribute to the observance of the prescribed amounts of energy and nutrients and to the development of a special form of nutrition. In this way, the diet helps to achieve and maintain stable blood sugar levels and to inhibit the complications of diabetes (damage to the vascular system, eyes, kidneys and other organs). Our manuscript is a gap-filling study as it focuses on the possibilities offered by gastronomy. We hope that we can contribute to the application of a healthy diet and thus to the achievement of the desired goals.

Opportunities provided by food groups to supplement therapy for type 2 diabetes

We present the most important features of dietary treatment of type 2 diabetes in the first part of our manuscript. We provide an overview of foods recommended for consumption with a description of the main food groups. In addition, it is important to use the nutrient table to determine the amount of energy and nutrients (specifically the carbohydrates) in foods.

Cereals: It is recommended to consume high-fiber products from cereals as a part of a diet for type 2 diabetes. Rye, whole wheat, oats and baked goods made from them are the most popular in the diet. The nutrient content of cereals contributes significantly to the recommended daily intake of carbohydrates, so the amount consumed is determined with each meal [7].

Vegetables and fruits: Vegetables and fruits play an important role in a healthy diet. Therefore, consumption of vegetables is also recommended for type 2 diabetes, taking into account their energy and carbohydrate values. The consumption of some fruits is less recommended due to their high carbohydrate values (e.g. bananas) [8].

Meats, meat products, eggs and fish: The development of type 2 diabetes is largely a lifestyle-related disease. Therefore, when consuming all food groups, it is advisable to eat according to healthy eating recommendations. It is recommended to consume the low-fat (for example: chicken) product from meats and meat products.



Egg protein is also a complex source of protein, while egg yolk should be avoided due to its high cholesterol content. Fish are beneficial sources of protein, vitamins and minerals, so their consumption is recommended in a wide variety. Meat, eggs and fish have variable energy content and low carbohydrate content [9].

Milk and dairy products: According to a healthy diet, it is recommended to consume half a litre of milk and dairy products. The sugar content (lactose) of milk leads to a sudden rise in blood sugar levels, so consuming milk is best recommended with the addition of fiber-containing foods. Fermented dairy products work well in the diet. Among milk and dairy products, it is also recommended to consume low-fat variations that don't contain added sugar. Monitoring their energy and carbohydrate content is important as well [10].

Oils and fats: It is very imperative to reduce the amount of total fat in type 2 diabetes. Plant-based fats contain unsaturated fatty acids, so consuming them is beneficial for the human body. Monitoring their energy and fat content is recommended [11].

Sweets, sugary foods and alcohol: Sugar-containing foods should be completely eliminated from the type 2 diabetes diet. Sugar (glucose) can be replaced by artificial (aspartame, acesulfame-K) and natural (stevia) sweeteners. Alcohol consumption, depending on the type, affects the human body in different ways. The special diet may include minimal alcohol and sweetened desserts with a meal, taking into account energy and carbohydrate values and the glycemic index of the product[12].

The opportunities offered by gastronomy as part of the therapy of type 2 diabetes

In the manuscript, we also present home-made foods (Figure 1-6) that also include food ingredients/ one person, quantities, energy, protein, fat and carbohydrate values. Therefore, it can also provide useful new scientific information for professionals interested in nutrition science and diet followers.



Ingredients/one person: fruits 200 g; muesli with stevia 30 g; total Energy:163 Kcal; Protein:3.5 g; Fat:2.2 g; Carbohydrate:34 g

Figure 1: Smoothie and muesli with stevia (Own recipe)



Ingredients/one person: plant based drink 2 dl; muesli with stevia 30 g; total Energy:159 Kcal; Protein:3.5 g; Fat:4.6 g; Carbohydrate:26.4 g

Figure 2: Plant-based drink and muesli with stevia (Own recipe)



Ingredients/one person: vegetables 200 g; chicken 80 g; pasta 100 g; total Energy:217.6 Kcal; Protein:27.7 g; Fat:1.9 g; Carbohydrate:21.5 g

Figure 3: Vegetable-chicken ragout with whole grain pasta(Own recipe)



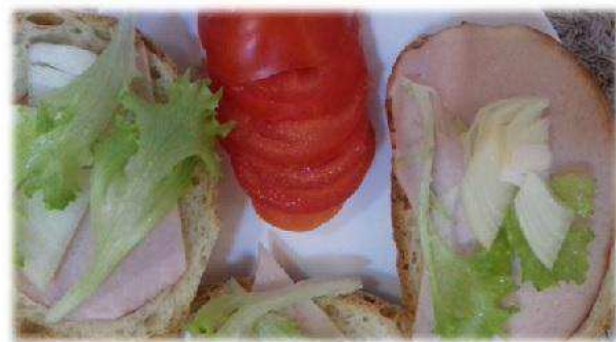
Ingredients/one person: Broccoli 200 g; kefir 40 g; bread 40 g; total Energy:158.8 Kcal; Protein:11 g; Fat:0.8 g; Carbohydrate:25.8 g

Figure 4: Broccoli-cream soup(Own recipe)



Ingredients/one person: ham 30 g; bread 80 g; onion 100 g; salad 100 g; total Energy:321.4 Kcal; Protein:11.24 g; Fat:5.9 g; Carbohydrate:42.64 g

Figure 5: Sandwich variations (Own recipe)



Ingredients/one person: ham 30 g; bread 60 g; onion 100 g; total Energy:255.8 Kcal; Protein:8.3 g; Fat:5.4 g; Carbohydrate:30.7 g

Figure 6: Sandwich variations (Own recipe)

Author's contribution

All the authors contributed equally. They read the final version, and approved it for the publication.

Conflict of interest

The authors declare that they do not have conflict of interest.

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References

1. Chowdhury, U. N., Islam, M. B., Ahmad, S., Moni, M. A. Network-based identification of genetic factors in ageing, lifestyle and type 2 diabetes that influence to the progression of Alzheimer's disease. *Informatics in Medicine Unlocked*, 19,1-9.2020.
2. Kumar, D. S., Prakash, B., Subhash, Chandra, B. J., Kadkol, P. S., Arun, V., Thomas, J. J., Kulkarni, P., Gopi, A., Narayana, Murthy, M. R. Technological innovations to improve health outcome in type 2 diabetes mellitus: A randomized controlled study. *Clinical Epidemiology and Global Health*, 9,53-56. 2021.
3. Andreoli., B., Mantovani, A., Andreoli, C. Type 2 Diabetes, Sarcopenic obesity and Mediterranean food pattern: Considerations about the therapeutic effect and the problem of maintaining weight loss and healthy habits. The outpatient experience of two clinical cases. *Journal of Clinical and Translational Endocrinology: Case Reports*,16,1-7.2020.
4. Alves, F. L. M. T., Laporta, G. Z. Prevalence and factors associated with lower limb amputation in individuals with type II diabetes mellitus in a referral hospital in Fortaleza, Ceará, Brazil: A hospital-based cross-sectional study. *Heliyon*, 6,1-8.2020.
5. Ueki, K., Sasako, T., Okazaki, Y., Miyake, K., Nangaku, M., Ohashi, Y., Noda, M., Kadowaki, T. Multifactorial intervention has a significant effect on diabetic kidney disease in patients with type 2 diabetes. *Kidney International*, 99,256-266.2021.
6. Arnason, A., Langarica, N., Dugas, L. R., Mora, N., Luke, A., Markossian, T. Family-based lifestyle interventions: What makes them successful? A systematic literature review. *Preventive Medicine Reports*, 21,1-3.2021.

Conclusion

Type 2 diabetes is a globally prevalent disease that has a major burden on health promotion institutions and hospitals. Its occurrence is most lifestyle dependent, so a complete lifestyle reform is needed. In our manuscript, we provided nutritional recommendations for the dietary treatment of type 2 diabetes, and then we applied these nutritional advices in practice. We prepare and present dishes with the possibilities offered by gastronomy. Furthermore, we used vegetables, fruits, whole grains cereals and bread, unsaturated fatty acids by vegetable oils and high protein meat in this dishes. Acute complaints and complications of type 2 diabetes (cardiovascular disease, kidney and eye damage) can also be avoided with the help of the special diet. In addition, our manuscript is a gap-filling study that can help scientists and thinkers get closer to the type 2 diabetes diets as well as its specific practical implementation with gastronomy.

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7. Pol, K., Graaf de, K., Diepeveen-de Bruin, M., Balvers, M., Mars, M. The effect of replacing sucrose with L-arabinose in drinks and cereal foods on blood glucose and plasma insulin responses in healthy adults. *Journal of Functional Foods*, 73,1-9.2020.
8. Clark, R. L., Famodu, O. A., Holásková, I., Infante, A. M., Murray, P. J., Olfert, I. M., McFadden, J. W., Downes, M. T., Chantler, P. D., Duespohl, M. W., Cuff, C. F., Olfert, M. D. Educational intervention improver fruit and vegetable intake in young adults with metabolic syndrome components. *Nutrition research*, 62,89-100.2019.
9. Kiguli, J., Alvesson, H. M., Mayega, R. W., Kasujja, F. X., Musingo, A., Kirunda, B., Kiracho, E. E., Nalwadda, C. K., Naggayi, G., Peterson, S., Ilmen van, J., Daivadanam, M. Dietary patterns and practices in rural eastern Uganda: Implications for prevention and management of type 2 diabetes. *Appetite*, 143,1-9. 2019.
10. Huth, P. J., DiRienzo, D. B., Miller, G. D. Major scientific advances with dairy foods in nutrition and health. *Journal of Dairy Science*, 89, 1207-1221.2006
11. Perona, J. S. Membrane lipid alterations in the metabolic syndrome and the role of dietary oils. *Biochimica et Biophysica Acta*, 1859,1690-1703.2017.
12. Temps, L. V. The truth about artificial sweeteners – Are they good for diabetics. *Indian Heart Journal*, 70,197-199.2018.

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