



Feeding Tourists and Recycling Food Waste in Sustainable Tourism Context

Assoc. Prof. Teodora Rizova, PhD

New Bulgarian University, ORCID ID: <https://orcid.org/0000-0002-1602-1258>

ABSTRACT: The main topics related to the nutrition of tourists, the processing of food waste and the implementation of the approach for sustainable tourism development in destinations are presented.

In the context of sustainability, the main requirements that must be applied are outlined, such as individualized nutrition tailored to situational needs, effective processing of food waste, and ensuring ecological security, which is a priority for tourists and the natural environment.

New approaches to ensuring balanced nutrition are presented, using local products and foods, applying new technologies in food preparation, and raising awareness among tourists about national cuisine and places to eat.

KEYWORDS: Environmental security, Sustainable development, Tourist nutrition.

1. NATURE OF SUSTAINABLE TOURISM

Sustainable development of tourism is defined as a process in which the current and future economic, social and environmental consequences of tourism activities are fully taken into account and the needs of tourists, industry, the environment and the receiving society are met.

Along with this, it should be taken into account that the tourism activity is a comprehensive, systemic activity, whose individual elements are directly and closely interconnected.

The tourism system is a dynamic system which in turn implies that it often undergoes changes that affect not only a certain element or subsystem, but ultimately lead to changes in all elements and subsystems.

Based on these two commonly known definitions, it can be pointed out that the development of sustainable tourism requires from the tourism system a simultaneous combination of extremely opposites, often diametrically opposite properties, and their harmonious combination to enable the development of tourism activity in its broad understanding, i.e. and as a development of the tourism product and as a development of the local communities and as a positive effect for the economy as a whole¹.

The study of the individual components of the tourism activity and their orientation towards the sustainable development approach enable the understanding of sustainable tourism to move from its purely theoretical consideration to practical dimensions that enable a new approach in tourism.

The practice of recent years, as well as the deep crisis that reached the tourism industry in connection with the COVID-19 pandemic, set the requirement for the active development of innovative activities in tourism and the transition to a qualitatively new level of development.

Important is the active development of information and communication technologies in tourism, including the capabilities of neural networks to assist tourists in choosing destinations and tourism products, speeding up logistics and the creation of new, significantly more individualised tourism products.

Along with this, however, there must be a completely new approach in the field of such classical subsystems of tourism as the meals, accommodation and overnight stays of tourists. No matter how developed the information system is, it cannot replace good food and service to tourists.

Something more. Today, many specialists in innovative technologies believe that the importance for individuals of the quality of traditional objects and processes is significantly increasing. And this means that tourists will want to realise their trips only in the conditions of uncompromising quality of every element of the tourism product.

¹KaferFlorian. Sustainability Leadership in Tourism: Interviews, Insights and Knowledge from Practice. Springer, 2022.



Each type of tourist activity has its priorities, but together with this, within the tourism products there are such elements that, without emphasising them, have a leading importance for the perception of the quality of the respective product. Such an element is the overall process of nutrition in tourism.

2. FOOD CONSUMPTION IN TOURISM AS A MAJOR COMPONENT OF EACH TOURISM PRODUCT

In different types of tourism activities, eating occupies a different place and has a different meaning.

In some it is a leading component, as is the case, for example, in culinary and sports tourism (in sports tourism, the need to maintain a certain diet is essential for the opportunities to realise this type of tourism), in others it has a complementary function, as in cultural or religious (pilgrimage) tourism.

Along with that, tourists' assessment of the quality of the tourism product is always determined by the quality of the meal (as the meal process includes both the quality of food products, dishes and drinks, and the quality of service related to the meal process during the stay) and together with this, this assessment has a direct impact on the assessment given for the other elements of the product (the conformity of the main tourism factor, the conditions of accommodation and overnight stays, transport, etc.)².

In all probability, the reason for this is that nutrition satisfying the basic energy-physiological needs of a person is one of the pillars depending on which all other activities that a tourist undertakes during a trip are determined.

Feeding tourists is also among the main elements that are included in the process of planning and implementing new tourism products.

At the same time, for effective planning, it is necessary to plan not only the complete feeding process, but also such elements of it as storage and processing of its waste products. This is necessitated by the high level of consumption of resources for effective implementation of nutrition.

The reason for the consumption of resources is that the feeding process cannot be planned with such precision as is possible with other processes related to the tourism product realisation.

Meal planning for tourists is always implemented within certain limits, for which the country providing the service must be ready.

The possibility of meals upon prior declaration by tourists creates certain inconveniences for them and is relatively rarely used today in practice, especially in renowned tourist destinations.

That is why, in the planning process, maximum amounts of food are always planned, and together with this, the presence of certain reserves is assumed, to be used if necessary³.

At the same time, the volumes of food products are relatively rarely used to the full extent of what was intended. Often, significant amounts of food products as well as prepared food are disposed of.

It should be noted here that both consumption volumes and disposal volumes are not known in advance.

In turn, this implies the occurrence of difficulties with the implementation of the process leading to irrational use of food waste.

The application of the sustainable development approach in tourism requires that this process simultaneously meet three main requirements:

- on the one hand, to satisfy the needs of the tourists to the maximum extent, as in a number of cases the meals (both as meals and as the products used for their preparation) should be individualised and meet the different situational needs of the tourists.

The focus on the individualisation of a tourism product requires a new way of implementing the meal process. Gradually, it will be necessary to move from the standardised menus, often used in large tourist flows today, to an individualised menu, which will be agreed in advance with the tourists and will be an independent part of the offered tourism product;

- on the other hand, the leftover food products should be processed efficiently enough so that the processing process is directly related to the process of production and supply of food for tourism. This process should be as gentle as possible to the natural environment, and it should not leave secondary products from the processing. Ideally, the processing of food waste should support the production of other products that can be used in the service of tourists;

²Vigolo V. *Older Tourist Behavior and Marketing Tools*. Springer, 2017.

³Alvarez Maria, Go Frank, Yüksel Atila (Editors). *Heritage Tourism Destinations: Preservation, Communication and Development*. CABI, 2016.



- the prevailing point of view in most countries suggests that the process of environmental security is a priority for most people, and this also applies to the tourists themselves to a significant extent.

It is for this reason that the process of waste disposal should be a priority not only for the catering organisers, but also for the tourists themselves.

Moreover, today it is quite possible that the very cycle of production - delivery - preparation - disposal of waste is part of the tourism product, and in some cases tourists can also participate in this process⁴.

Getting familiar with the requirements for a sustainable approach to the nutrition of tourists, it can be established that there is nothing fundamentally new in them.

Since the beginning of agriculture, the main requirement for acquiring products from nature is to use them for different purposes and, if possible, without forming waste elements. For this reason, a number of plants that were used as food in one part were used in another as medicine or as food for working or meat-producing animals.

Modern dimensions are no less essential for the development of both the product security of mankind and for the achievement of a high degree of efficiency for the specific activity, in particular for tourism.

Achieving a high degree of individualisation of nutrition today has a significant value, which directly affects the cost of the tourism product.

Accordingly, the higher cost significantly limits the accessibility of various tourism products.

3. NEW APPROACHES TO PROVIDING TOURISTS' FOOD CONSUMPTION

The COVID-19 pandemic, as well as the expectations of doctors for the possible occurrence of similar pandemic situations in the future, call into question the model of mass tourism, which was characteristic of the end of the past and the beginning of the current century. Tourism is becoming more and more individualised, as well as significantly more focused on preserving the health of tourists and avoiding situations that could endanger it.

Quite naturally, this also affects the field of nutrition, as the use of unified recipes, which satisfied the needs of tourism earlier, today is increasingly losing its appeal among tourists.

Based on this, it is necessary to search for new, sustainable approaches to the nutrition of tourists. Among them, the following deserve special attention:

a) Serving local products and dishes

In contrast to the existing practice of large-scale supplies, which are carried out by larger suppliers for the objects of modern tourism, in the future leading importance will be given to the use of local products and dishes in the region where a tourist activity is carried out.

This circumstance is related both to the individualisation of the tourists' menu, and to the need to reduce transportation costs for food products, as well as to the interaction between local structures and the tourist business. This type of interaction will enable the construction of economic systems that are mutually beneficial for the participating countries.

In particular, one of the possible options for such an interaction is the construction of a closed loop of food preparation and waste processing within a single process.

The transition to new recipes and offering a new assortment of dishes to tourists is also of significance.

It should be noted that today active work is being done on the adaptation of various elements of the national dishes to wider taste preferences, including those that are diametrically opposed to the tastes of the local population.

Modern technologies used in the food industry make this possible.

Along with this, through the use of local dishes and drinks, conditions are created for significantly more secure memorisation of individual characteristics, and under the appropriate conditions, of the tourist brand⁵.

⁴Kosseva M., Webb C. (eds.) Food Industry Wastes: Assessment and Recuperation of Commodities. 2nd Edition. — Academic Press, 2020

⁵Hall C.M. Wine, Food, and Tourism Marketing. Routledge, 2004.



b) Using fundamentally new technologies in the preparation of various dishes for tourists

Modern technology is about to fundamentally change not only the preparation of food, but also the process of taking orders, as well as a completely new, individualised approach to take into account the health characteristics of customers.

Biotechnologies make it possible, based on the use of specific microorganisms, for practically every dish to acquire the taste that is closest to the taste preferences of tourists. This significantly overcomes the problem arising from the specifics of some kitchens.

The transmission of certain forms of dishes through the use of 3D printing used for the needs of food production is of essential importance.

New technologies and, above all, information technologies make it possible to significantly more accurately plan consumption, as orders thanks to neural networks can adapt the menu of individual tourists to their health status, traditional national or regional preferences, as well as the preferred periods in which to carry out the feeding of the tourists.

Practically every dish can be oriented to the specific taste needs of the tourist on the basis of the corresponding food algorithms, which are based on the functioning of the neural networks.

The delivery of food (an essential factor in most tourist trips) can be carried out practically to any place (and not as it is now to a strictly defined one) and together with this the costs of the logistics associated with the delivery do not exceed those costs that are now carried out for the same function. This effect is achieved thanks to the productisation of the delivery as well as the rapidly adaptable elements related to food serving⁶.

c) Significantly higher level of tourist awareness

Information technologies make it possible for food not just to be one of the main elements of a tourist trip, but also to be associated with increasing the level of awareness of tourists.

Of course, even today, in most cases, they receive relatively comprehensive information about the content of the products in the meals, their weight and value.

But new technologies, and in particular multisensory technologies for enhancing the gastronomic experience, significantly expand the level of knowledge, give the tourist the opportunity to feel the peculiarities of the food that will be served to him, to learn its history, to gain insight into the essence of its production, and often the possibilities for the beneficial utilisation of the relevant food products.

Information technology enables the tourist not only to be informed, but also to be an active participant in the process of food preparation, even if this is initially realised on a virtual level.

The ability of the corresponding neural networks to orientate on his preferences depends to a significant extent on the tourist's active participation in the food preparation process, and this also means a higher degree of tourist satisfaction with the offered service⁷.

4. RECYCLING FOOD WASTE IN TOURISM: PRESENT CONDITION AND PROSPECTS

As already stated, the processing of waste in the tourism catering process has two main aspects.

On the one hand, this process should reduce environmental pollution, and on the other hand, significantly increase the efficiency of activities related to providing nutrition.

It should be noted that a change occurs not only in the technical and technological elements related to the processing of waste from the food process in tourism. The interest and philosophy of the attitude towards this process is changing.

In the second half of the last century, the main problem related to feeding tourists was finding a sufficient amount and ensuring the necessary quality of food, taking into account the tastes of a large number of consumers with different preferences.

The commitment of the tourist enterprises was related to the timely handing over of the waste and following the minimum requirements set by the local authorities.

Obviously, following the principles of sustainability in tourism in general and in the field of nutrition in particular require new approaches and in the first place these must be new forms of process management.

⁶Hjalager Anne-Mette, Richards Greg. Tourism and Gastronomy. Routledge, 2002.

⁷Patterson I. Tourism and Leisure Behaviour in an Ageing World. CAB International, 2018.



These new forms should to a greater extent correspond to the main characteristics of sustainable tourism and in particular to the following:

- individualisation of a tourism product requiring an activation of various structures, inclusion of a wide range of goods and services to ensure the product, operational interaction with various structures both at the place where the product is offered and the logistics chain;

- orientation not only towards the achievement of a positive economic result for the specific business entity, but also possible support for other organisations participating in the activity;

- active support for the protection of the natural environment, preservation of biodiversity and the inviolability of the natural complexes in the respective destination;

- close interaction with local communities, considering those that can be referred to the category of informal organisations.

Even the specified elements (the list of which is obviously incomplete) give reason to change the existing principle of process management, including food waste processing processes.

Today, management in most cases is of a cybernetic nature, which suggests that it is implemented through relatively strictly hierarchical structures that are relatively stable over time, but on the other hand, it is extremely difficult to adapt to the changing conditions of the environment, as well as to be adapting to new and diverse requirements related to the offer of rapidly adaptable tourism products.

Such a management structure is also relatively closed, the reason for which is both objective requirements (for example, requirements of legislation) and subjective reasons such as the reluctance of management to comply with the interests of structures that, according to the same management, are less important.

The mentioned type of management meets the needs of sustainable tourism to a very small extent.

For its full realisation, another model is needed, and in particular the model of synergistic management.

With it, the main emphasis is placed on the horizontal approach, in which synchronised management of separate, smaller business entities is realised.

Each one of them has its own programme, goals and tasks, being significantly more flexible in choosing specific solutions, finding ways to deal with specific market situations.

Along with this, enterprises operating in the network have common strategic goals and objectives, and operational and technical solutions are subordinated to these goals and objectives in ways that are most effective in specific cases.

In the initial stage of the operation of such a system, certain contradictions may arise, but they are gradually smoothed out as the achievement of the common strategic goals not only does not suffer losses, but also gets an opportunity for significant self-improvement. Over time, the system acquires a high degree of resistance and adaptability to various external influences.

Among the various functions of sustainable tourism in which synergistic management finds its expression, waste processing is perhaps among the most benefited from it. The reason for this is the circumstances I mentioned above, namely⁸:

- the need for coordinated actions of different economic entities having different sizes and functional orientation.

More specifically, these can be both tourist companies and organisations, as well as agricultural enterprises of different sizes and ownership, specialised organisations for waste processing, enterprises and local government bodies, and even impersonal associations operating within the specific region.

The principle of self-organisation used by the synergistic management model allows a high degree of operational independence, and together with this, the synchronised actions of all enterprises enable the achievement of goals with a high degree of social and economic efficiency for each of the participating enterprises.

The use of the synergistic approach to management will allow the creation of a full-fledged, closed cycle providing quality nutrition - high degree of processing of food waste.

This approach will also be significantly more effective when implementing new forms of cooperation such as cross-border cooperation (it is assumed that with an effective organisation, the waste produced in one country will be able to be processed in

⁸León-Castro E., Blanco-Mesa F., Alfaro-García V., Gil-Lafuente A.M., Merigó J.M., Kacprzyk J. (eds.) *Soft Computing and Fuzzy Methodologies in Innovation Management and Sustainability*. Springer, 2022.



another, as this activity is effective enough for both countries), the formation of public-private partnerships and effective cooperation with local communities, which is extremely important for the implementation of many forms of specialised tourism activity⁹.

Quite naturally, the analysis of the processing of food waste in tourism is also related to the technical features of these processes. The technical characteristics have a direct impact on what are the opportunities for participation in this process for a certain number of economic and social entities, as well as what will be the effectiveness of conducting the relevant process.

Today there are some of the elements that use food waste as raw material, and in this regard there are two approaches:

- one of the main technical solutions existing today is the creation of fertilisers based on the natural decomposition of food waste. The composting process makes it possible to involve a number of business entities in the process, and in particular plant growing enterprises that actively use compost in their production.

Of course, such use of waste from the food process can be used far from all tourism sites, due to both the high degree of complexity in transporting the relevant waste, and due to the presence of sufficiently strict requirements of an ecological nature to the technological process itself of composting.

With the development of composite materials, as well as the active development of bioengineering, the technological processes that are used in the composting process are becoming more and more perfect. Accordingly, the field of application of this method is gradually expanding, in the processing of waste from various tourist activities.

One of the increasingly popular approaches to waste processing is vermicomposting, a process of processing food waste by enlisting natural biological processes. With this approach, environmental risks are significantly reduced, and together with this, some additional technical difficulties arise, caused by the need to create special conditions for the development of technological processes.

- the second existing technical solution in the process of processing food waste is its use as a raw material for the creation of biogas. In this direction, there is a significant reserve for development, taking into account the fact that it is biogas that is used in various activities of the communal economy.

It is in this case that substantial reserves can be sought for interaction between tourist enterprises and local government structures. For now, there are certain difficulties caused by the fact that tourist organisations can hardly plan the volumes of raw material that they could provide for the production of biogas.

It is assumed that the use of modern information and communication technologies is able to positively influence this process, in this case using the industry-known principle of raw material supplies just in time¹⁰.

Not only the modern technological forms of using food waste, but also those that belong to the perspective category are of essential importance.

The majority of them are related to the development of biotechnology and, in particular, bioengineering. Entering various fields of artificial intelligence is also assumed as an additional opportunity for the use of food waste.

In addition to the technologies that exist today, it is also essential to determine the technological perspectives for the processing of food waste.

Many of the promising technologies that exist today as plans or experimental samples use food waste as the main raw material. In particular, it is about various projects in bioengineering. In this aspect, the development of various microorganisms is assumed, which can be important in such fields as medicine, energy, processing of hazardous waste, etc.

Certain raw materials are necessary for the development of the relevant microorganisms, and food waste is considered as such.

Another area of bioengineering is the development of new food products, also based on the activity of microorganisms with predetermined parameters. In this case, these microorganisms need a suitable biological environment in which the food waste can be used.

It is extremely clear that in order for food waste to fulfill its functions as a raw material, there should be a significant change in the processes of collection, sorting and transportation and storage of food waste. It is obvious that the methods existing today cannot meet these needs in terms of precision and completeness of actions.

⁹Wong J., Kaur G. et al. (Eds.). Sustainable Food Waste Management: Resource Recovery and Treatment. Elsevier, 2021.

¹⁰Karthikeyan O.P., Heimann K., Muthu S.S. (Eds.) Recycling of Solid Waste for Biofuels and Bio-chemicals. Springer, 2016.



Essential help in this regard will be provided by both the elements of root technology and neural networks, which will allow very precise sorting of food waste, their safe transportation and appropriate storage before they are used for the respective purposes.

Of course, the use of both traditional and new technologies requires a very high degree of organisation. Also, the achievement of the necessary qualification by the personnel who will be engaged in the processing of food waste from the tourism activity is also important.¹¹

REFERENCES

1. Acharya B., Dey S., Zidan M. (eds.) IoT-Based Smart Waste Management for Environmental Sustainability. CRC Pr I Llc, 2022.
2. Alvarez Maria, Go Frank, Yüksel Atila (Editors). Heritage Tourism Destinations: Preservation, Communication and Development. CABI, 2016.
3. Hall C.M. Wine, Food, and Tourism Marketing. Routledge, 2004.
4. Hjalager Anne-Mette, Richards Greg. Tourism and Gastronomy. Routledge, 2002.
5. Kaefer Florian. Sustainability Leadership in Tourism: Interviews, Insights and Knowledge from Practice. Springer, 2022.
6. Karthikeyan O.P., Heimann K., Muthu S.S. (Eds.) Recycling of Solid Waste for Biofuels and Bio-chemicals. Springer, 2016.
7. Kosseva M., Webb C. (eds.) Food Industry Wastes: Assessment and Recuperation of Commodities. 2nd Edition. — Academic Press, 2020
8. León-Castro E., Blanco-Mesa F., Alfaro-García V., Gil-Lafuente A.M., Merigó J.M., Kacprzyk J. (eds.) Soft Computing and Fuzzy Methodologies in Innovation Management and Sustainability. Springer, 2022.
9. Patterson I. Tourism and Leisure Behaviour in an Ageing World. CABI, 2018.
10. Vigolo V. Older Tourist Behavior and Marketing Tools. Springer, 2017.
11. Wong J., Kaur G. et al. (Eds.). Sustainable Food Waste Management: Resource Recovery and Treatment. Elsevier, 2021.

Cite this Article: Rizova, T. (2025). Feeding Tourists and Recycling Food Waste in Sustainable Tourism Context. International Journal of Current Science Research and Review, 8(8), pp. 4359-4365. DOI: <https://doi.org/10.47191/ijcsrr/V8-i8-45>

¹¹Acharya B., Dey S., Zidan M. (eds.) IoT-Based Smart Waste Management for Environmental Sustainability. CRC Pr I Llc, 2022.