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Glavni urednik: Prof. dr Suad Bećirović
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FOREWORD BY THE EDITOR

Dear readers, colleagues,
It is our great honor and pleasure to present to you the edition of our journal "Economic Challenges", which specifically treats the issue of sustainable development from the aspect of "halal", i.e. Permissible in Islamic teaching.
The halal market today represents a highly dynamic market that occupies an increasing share in global economic activity, while sustainable development has become the number one topic in the world that is connected to all life issues in society, the economy and everything that surrounds us. Whether the regulations and principles of halal production, tourism, finance and the like are complementary or different in relation to sustainability are topics that you can learn more about in published works.
Finally, we express our satisfaction that the published works are coming from all over the world and we thank the authors, partners and everyone else who contributed in any way to the development of our scientific journal.
Until the next call for the publication of works, salaam and greetings to all of you.

Editor-in-Chief: Prof. dr Suad Bećirović
Doc.dr.sc. Aldin Dugonjić

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SYNERGISTIC OPPORTUNITIES BETWEEN THE HALAL FOOD & TOURISM SECTORS TO CREATE VALUABLE GASTRO TOURISM EXPERIENCES

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Abstract
The Halal Travel market is estimated to be worth USD 225 billion by 2028 and remains one of the fastest-growing segments in global travel and tourism. With this growth naturally comes an increasingly competitive market. Meanwhile, there are new and evolving dynamics in the considerations of Muslim travelers, with regards to the desired experience, destination, and expectations. Considering the unprecedented competition and the resurgence of international travel, how can a destination create a competitive edge while also supporting sustainable and responsible tourism practices?
This paper explores the possibilities presented by the intersection of Halal Tourism and Halal Food, where the creation of culinary gastro-tourism experiences can be a valuable source of tourism that supports the local economy, protects cultural heritage and attracts high-value travelers. Primary research in the form of surveying Muslim travelers both before and during the pandemic forms the foundation of research in this paper and is supported with secondary sources in the form of reports, indexes and media sources.

Key word: Halal Travel market, Halal Tourism, Halal Food, Muslim travelers, pandemic.
JEL codes: L66, Z3

INTRODUCTION

Two very important sectors of the Halal industry- Halal Food and Halal Tourism- have an enormous opportunity for impact when they come together to create synergistic experiences for the consumer. There is no better time than the post-pandemic era for businesses and individuals across both sectors to analyze and prepare the opportunities for unique experiences to be offered to hungry and restless travelers. Culinary Tourism (also referred to as Gastro Tourism) is a growing industry where the main focus of attraction is the food or culinary heritage at the destination of choice.

The experiences offered host a springboard location for travelers to begin adventures and exploration. This is the perfect combination for the Halal industry to embark upon in that there is a perfect intersection of Islamic heritage sites intertwined with culinary legacy throughout the Muslim world and beyond. When professionals in both industries create combined experiences that benefit local communities, business owners and the environment, they can begin to provide the modern traveler with everything he or she is seeking while at the same time meeting UN SDGs and preserving instead of exploiting cultural significance and heritage sites that are being explored.

This paper serves to describe the landscape of the business environment and all of its digital tools and resources, making it ripe for success. It will also discuss the key factors necessary for the mobilization of efforts to put experiences in place which combine both the Halal travel and Halal food industries in the most efficient and economically viable ways.

RESEARCH METHODOLOGY

Research conducted for this study was done in various ways. Halal Travel Guide conducted primary research in November 2021 by surveying 262 Muslim travelers from around the world. Fieldwork has been conducted between August 2021-present, whereby Soumaya Hamdi has met with Muslim travelers on trips and obtained anecdotal information. One of the most important and research-driven ways used by the author was attending key conferences and meeting with chief Halal industry leaders and influencers in both the food and tourism sectors. The author served as an advisor to the Uzbekistan government by presenting at the Tashkent International Tourism Fair (2020); presenting Demystifying Muslim Food-Loving Travelers at the World Food Travel Association Food Trex Global (2020); presented Around the World on a Halal Diet for Food Travel Talk TV (2021); Rethinking Experiences and Activities: The Next Big Thing at the Halal in Travel Global Summit (2021). Reading key journals and studies in the culinary tourism sector was also conducted. Other sources are cited in the bibliography.

STATE OF THE HALAL TRAVEL MARKET POST-PANDEMIC

Estimated to be worth USD 225 billion by 2028 , the Halal Travel market continues to prove itself as one of the fast-growing segments in global travel and tourism. With 70% of the global Muslim population under 40 years old and 60% under 30, the Muslim Travel market is also one of the first to show signs of a strong recovery since the pandemic first impacted international travel in 2020. The terms ‘Halal Travel’ and ‘Muslim Travel’ market will be used synonymously in this paper, referring to the global population of approximately 2 billion people who follow the religion of Islam. This is a very diverse market that spans several languages, cultures and continents. We must therefore note that such a vast and varied market will require different approaches tailored to each sub-segment. For the purposes of this paper, we will be

focusing on the largest and most economically powerful segment of the market; the 70% of Muslim travelers aged 40 and under. This segment is:

- Highly educated
- Technologically savvy
- Speak English (whether as a first or additional language)
- Care about maintaining their religious values both at home and abroad

Though we have not restricted our audience based on gender, it would be remiss not to note the influential role Muslim women are having in shaping the Halal Travel market, both as consumers and as entrepreneurs.

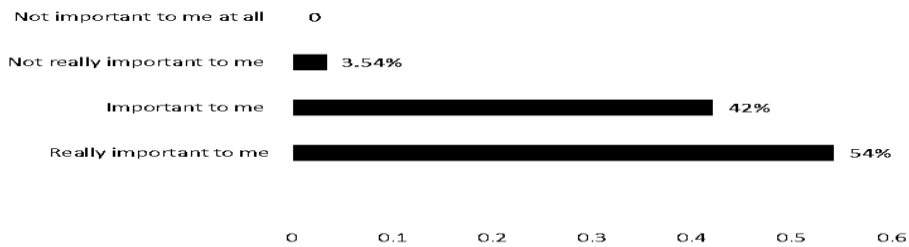
WHAT DO MUSLIM TRAVELERS WANT?

To put it very simply, Muslim travelers are seeking connection. They are searching for travel experiences that are transformative. They want to travel not just to rest or shop, but to feel a connection to the place and people they are traveling to, by exploring the local food and culture. This is not just observable anecdotally, from conversations the author has had with Muslim travellers, but also statistically.

Prior to the pandemic (in 2018), Halal Travel Guide surveyed 404 British Muslims and found that 83% of Millennial Muslim travellers like to connect with the local community.

In November 2021, Halal Travel Guide conducted another survey, this time with respondents from around the world. More than 260 Muslims from across the UK, Malaysia, Indonesia, Singapore, US and Europe answered questions about their preferences when it comes to travelling abroad as a Muslim. When asked 'How important is it for you to connect with locals and their food, history and culture while you're traveling?', their responses were almost unanimously agreed that yes, it is important. 96% of respondents said it's either 'important' or 'really important' for them to 'connect with locals and their food, history and culture' while traveling (Figure 1).

Figure 1: How important is it for you to connect with locals and their food, history and culture while you're traveling?



Source: Results from the 2021 Halal Travel Guide survey into Muslim travelers from around the world. Respondents surveyed were from the UK, Malaysia, Indonesia, Singapore, the US, Turkey, the Gulf States and Europe.

The results show something significant. Travel for Muslims appears to mean more than just taking a vacation. Muslims are traveling to explore and feel a sense of connection to the place they have chosen to visit. They are traveling to meet new people, learn about new cultures, try new food and explore their Islamic heritage. There are of course huge benefits to hosting travelers who are interested in connecting with the local community. From an economic perspective, there is a higher chance that the locals will directly benefit from the traveler's visit, whether it be by having the traveler eat at local restaurants or hiring a local tour guide. The intangible benefit is harder to measure but is perhaps much more impactful. Building bridges between the traveler and the local people in a destination can support the preservation of traditional crafts, traditional cookery and even traditional ways of life. For the traveler, access to experiences unique to a destination will create an emotional connection to the destination and will not only encourage the traveler to make future return trips, but to share their experience with their social networks, creating a ripple effect.

This type of experience that empowers the traveler to explore a foreign destination with the support of locals is currently underserved in the Halal Travel Market. Halal Tourism stakeholders, particularly tourism boards, have the opportunity to support the development of new tourism products that will attract this segment of Muslim travelers who are keen to access immersive travel experiences. Of course, to be truly immersive and supportive of responsible tourism, such tourism products must be created with the input and support of locals. By working with locals to produce these authentic experiences it becomes possible to develop new halal tourism products that bring direct benefit to the local community and economy, while supporting the preservation of intangible heritage and culture. This is a crucial step towards helping halal tourism grow in a way that is more sustainable and supportive of responsible, ethical business practises.

And while Halal Tourism in many countries is booming with the rise in halal resorts/hotels, there is still a lack of travel experiences being created designed with this type of Muslim traveler in mind. The gap in this service provision is starting to be filled through the efforts of private entities, but still lacks investment from tourism boards and governmental agencies.

HALAL CULINARY TOURISM AS A DRIVER FOR CONNECTION AND ECONOMIC BENEFIT

As indicated above, Muslim travelers have expressed a deep interest in having experiences on their travels. The emergence of the Halal Food sector globally allows for the expansion of such experiences in the Halal Travel sector, even when travel is not necessarily within a Muslim country. With the availability of halal foods and a greater understanding of halal dietary guidelines and practices globally, the possibilities of culinary or gastro-tourism experiences are endless and can thus be created to provide a deeper understanding of a particular location, its food history and the Islamic heritage embedded in each locale- all of which are experiences requested and desired by Muslim travelers.

While some cities around the world are saturated with tourists, designing experiences in lesser known areas is an investment in unique, off the beaten path type of places that often preserve traditional lifestyles and culture. It is also a useful technique to deal with the harms of over-tourism that continues to increase with the proliferation of 'Insta-worthy' places to visit. Village life often includes a more natural and sustainable way of living and is an attractive experience for the stressed out traveler from larger cities. An investment in these villages may help preserve traditional cooking methods, organic farming, and sustainable animal husbandry in that tourism provides the opportunity to pump investment into these places - when conducted in partnership with the locals - and preserve a way of life that is dying out around the world.

In addition to satisfying the needs and desires of Muslim travelers, culinary tourism brings with it enormous economic benefits to the local economies in which each trip is planned. Travelers will spend approximately 25% of their money on food on any given trip, and if they are sent out to forage on their own, their spend could possibly end up in the hands of international food chains as opposed to local restaurants, culinary classes, and street foods owned by local vendors. Additionally, a well-planned gastro-tour would open up the location to expert locals with knowledge and information not found elsewhere, leaving the travelers with unique experiences they will take back to their home countries, as well as stabilizing income for local entrepreneurs who are deeply invested in the improvement and sustainability of their local economies. These key economic indicators also align well with the UNWTO SDGs for 2031. [3]

A MODEL FOR DEVELOPING SUSTAINABLE HALAL TOURISM PRODUCTS AND SERVICES

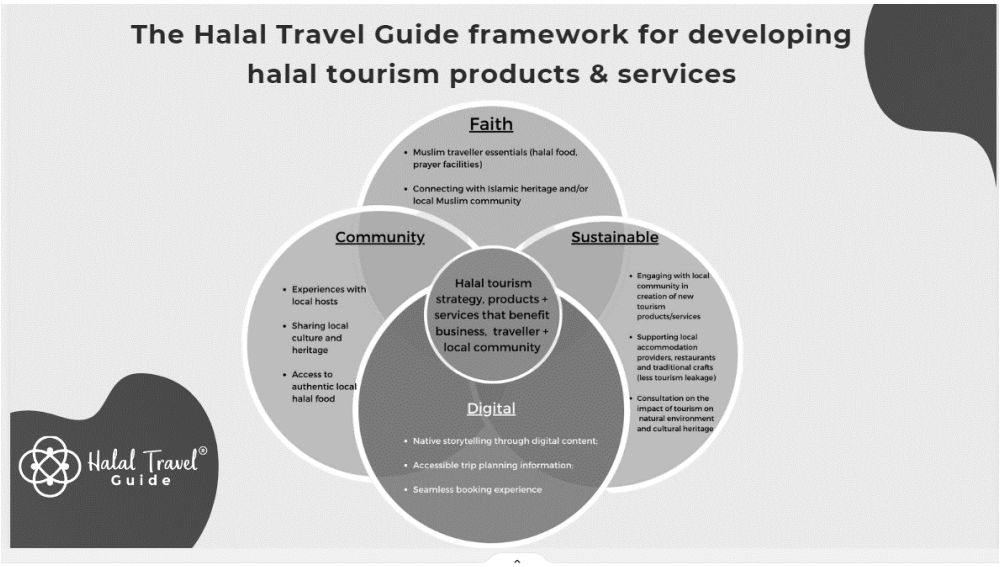
While Halal Tourism continues to be one of the fastest growing segments of international travel and tourism, more research and work is needed to ensure that this growth is sustainable. If tourism is truly to be halal, we must always go back to the Maqasid of the Shariah - the aims of the Shariah - which is generally translated as:

"Fulfilment of goodness and righteousness and warding off or getting rid of corruption and destruction."

Ahmad Raysuni, Introduction to Maqasid Shariah.

Halal Tourism, therefore, must be beneficial for a) travelers, b) destinations and c) people living in those destinations. And with the impact of climate change and overtourism, developing a responsible business model for Halal Tourism is not only beneficial; it is a necessity. To support this development, Halal Travel Guide has created a model for the creation of Halal Tourism products that support responsible tourism (Figure 2)

Figure 2: This model has been created using both qualitative and quantitative data gathered by the Halal Travel Guide over the course of several years, from targeted surveys along with visits to several countries and interactions with locals and Muslim travelers from around the world.



Source: Halal Travel Guide

SOCIAL MEDIA MARKETING FOR HALAL TOURISM

Much like the marketing of halal food to the world, marketing halal tourism should be prioritized for anyone interested in promoting well-designed experiences to any global destination. While the halal food industry is growing at $500 million per year , we can say that the increased demand is part and parcel of the response to the availability of information online and ease of access for consumers to make requests of companies to carry halal foods as well as to ensure the quality and certainty of the halal certification. Consumer education and standards are growing with the sheer amount of time spent on social media channels such as TikTok, Instagram and YouTube especially. Those with the disposable income to travel will not only seek out halal food wherever they go, but they will also seek out high quality experiences that they might have already seen on social media such as the TikTok and IG reels of Halal Travel Guide and My Halal Kitchen during recent trips to the Bosnian cities of Mostar and Sarajevo, where delicious foods enticed viewers to inquire about the next planned tours of these destinations.

THE DEMOCRATIZATION OF INFORMATION LEVELS THE PLAYING FIELD

There is no doubt that the internet and social media are having a huge impact on the development of Halal Tourism. Couple this with the fact that 70% of the global

Muslim population are under 40 and therefore likely to be regularly using the internet and social media to plan their trips, it is now easier than ever to send curated messages to Muslim travelers. Social media in particular is becoming increasingly powerful not just for marketing but also for purchases. In the last couple of years, social media applications such as Instagram and TikTok have grown to build their own in-app e-commerce capabilities, allowing users to shop without ever leaving the app.

Despite the high level of internet connectivity and social media use amongst Muslim travellers, there is a perceived lack of messaging that aims to target and attract this market segment. When Halal Travel Guide surveyed 262 Muslims from around the world in 2021, the results showed Muslims still feel there is a lack of travel information designed to attract and inform Muslim travelers (Figure 3). This is signficant, not just because halal travel is booming. It is because the majority of Muslims - 78% according to Halal Travel Guide research (Figure 4) - say they are more likely to visit a destination when they see a visibly Muslim traveler shown in travel marketing material.

Figure 3 How often do you see a visibly Muslim traveller featured (either online or elsewhere) in a travel advert, magazine or social media campaign?

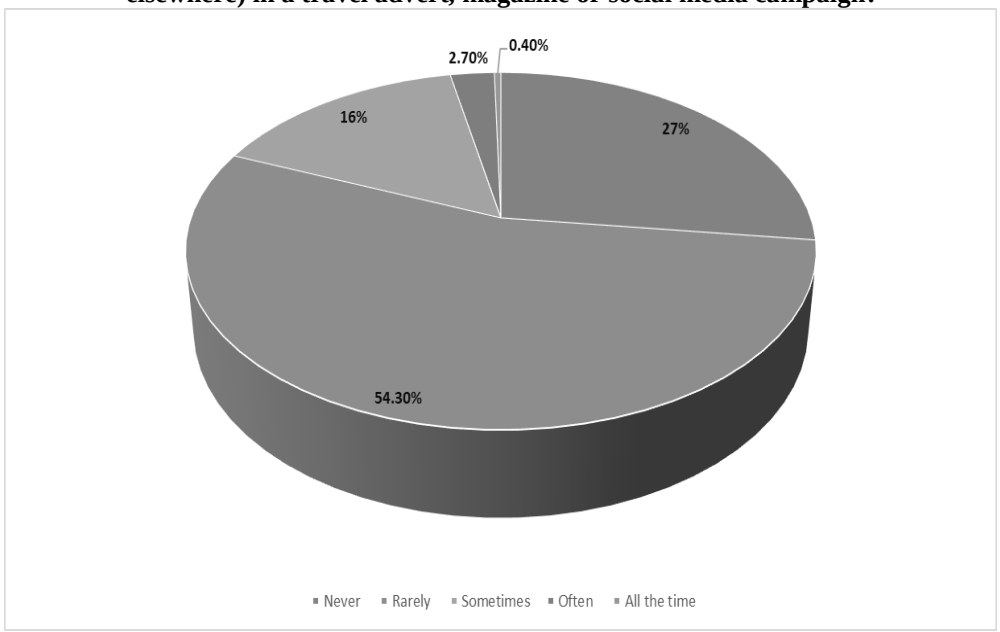


Figure 3: 81% of Muslims surveyed said they either ‘never’ or ‘rarely’ see a visibly Muslim traveler featured in travel marketing material.

Figure 4: Does seeing a visibly Muslim person on a country's travel branding and advertising make you more or less likely to visit that country?

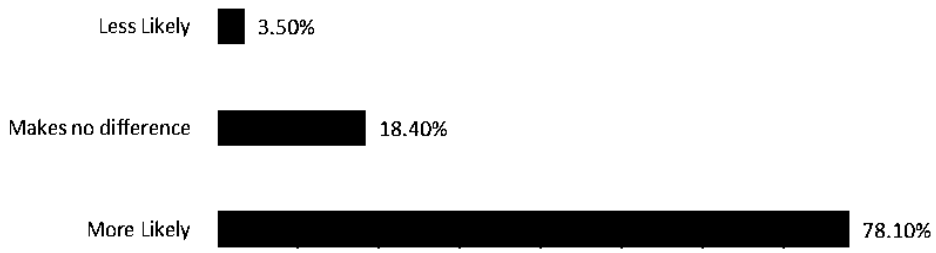


Figure 4: 78% of Muslims surveyed said that they are more likely to visit a country that uses a visibly Muslim traveler in their marketing material.

For example, Halal Restaurant week in South Korea sends a warm invitation to Muslims to "come as you are to enjoy authentic Korean food, and we'll even show you how to make the halal versions of our recipes". In OIC countries this can go even further to deeply explore Islamic food history of the Silk Road, the Ottoman Empire and so much more. Recently, the government of Uzbekistan reached out to the authors of this paper to garner specific ideas for gastro-tourism programs in the country, much of which would include the utilization of social media to record and publicize local art, culinary and heritage sites in the country. It is initiatives like this, stemming from government institutions with their ministry of tourism that will help to elevate and execute such important and impactful initiatives that bring about global travelers to experiences places they might not have otherwise thought to visit.

In non-Muslim countries, tourism boards can work with Muslim chefs and experts to tweak authentic and traditional recipes to make them halal so that Muslims may enjoy and feel welcomed - quite literally a form of culinary diplomacy - shaping the reason for connecting with food during travel in the first place.

Particularly for Muslim travelers who require extra assurance due to halal requirements, more effort is needed than the average food traveller. Yet most places don't have easy access to one stop shops to find the best halal local food. This is an opportunity for halal certification bodies to join the halal tourism sector and work together on certifying various restaurants and local food vendors verified by legitimate halal tourism operators, all of which will give a value-added benefit to travelers, lending to more assurances, respectability and economic stability to all parties involved.

CONCLUSION

In conclusion, halal food and halal tourism go hand in hand in a multitude of ways that should not be ignored. The parties involved in each sector have ample opportunities to come together for the benefit of their individual business ventures and for the long-term sustainability of the socio-economic and environmental impact of tour locations while satisfying the needs and desires of the Muslim Traveler. When business practices are in line with the UNWTO SDGs and concrete marketing plans are created and implemented by government agencies and businesses alike, the impact can be seen almost immediately. It is with good intention that the authors of this paper hope to advise and encourage a holistic, healthy approach to sustainable food and travel (Halal Gastro Tourism) programs in the Halal Food and Halal Tourism sectors combined.

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THE DIGITAL HALAL ERA - A LOOK INTO THE NEW NORMAL

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Abstract:
As the US $8 trillion global food supply chain is adapting to a post Covid-19 world becoming the new norm, so too is the Halal food system experiencing radical evolution and progression. As innovative technologies spawn new services and digital models, they also strengthen the transparency and integrity of Halal processes and certification and provide the capabilities to establish international Halal best practices alongside mainstream food industry sectors. Awareness is growing of the need to establish Halal systems and regulatory frameworks that will better ensure public interest, including consumer protection and confidence, whilst also advancing towards a viable digital Halal economy. Digital globalization has enabled globally accessible marketplaces where convergences towards digital economies have improved efficiencies as well as developed and strengthened interdependent relationships between services and networks. Rejeb states that, "the combination of blockchain and IoT technologies can be used as a powerful tool to orchestrate Halal food processes and ensure self-organized, transparent and smarter Halal Food Supply Chains (HFSCs). Leveraging blockchain with IoT technologies in the Halal food industry thus holds the potential to restructure conventional ways of managing Halal food traceability, promoting more credibility and trust in Halal certification, and ultimately boosting the Halal economy." (Abderahman Rejeb, 2021) We are in a new digital era of Halal and this paper will discuss the economic impact of a digital Agri & Halal ecosystem and what the essential determinants are to its holistic long-term success.

Keywords: digitalization, digital economy, Agri & Halal ecosystems, interoperability, Halal digital data, Halal sustainable development, Halal food supply chains.

JEL codes: D8, L15, L66

INTRODUCTION

The dual function of Halal as both a brand for business and as an ideal of religious function and qualities has given rise to complexities caused by the struggle over Halal authority in a global context. This has become even more relevant in the discussion around the development of a global Halal ecosystem and of an accompanying standardised regulatory framework. The inability of global Halal authorities to

collaborate and work together to build a strong, inclusive global Halal masterplan remains a significant contributor to the complexities, confusion and fragmentation in the global Halal system. The success of Halal lies in strong, inclusive leadership with a shared goal to advance the Halal industry and ultimately better serve the global Muslim population as its primary goal.

A customer-centricity approach underpins a healthy ecosystem, where an ecosystem becomes healthy and sustainable when it connects a wide range of participants and caters to the growing demands of its customers. A digital economy strengthens the interdependent relationships between services, networks and industry stakeholders. According to the ICC Commission on the Digital Economy policy statement, "the ultimate beneficiaries of this virtuous cycle and symbiosis are national economies." (ICC Commission on the Digital Economy, 2016)

There is a compelling economic reason to encourage regulatory reformation in implementing policies and frameworks that support and encourage the adoption and use of key IoT technologies and digital systems. (Abderahman Rejeb, 2021) International best practice shows that a clear vision and strategy is key and must include a solid institutional framework with detailed regulatory basis. This is a key requirement to accelerate infrastructure roll-out and stimulate the development of the global industry. (ICC Commission on the Digital Economy, 2016)

A STANDARD HALAL REGULATORY FRAMEWORK

Halal Accreditation Bodies work to reject rogue and/or fraudulent certifiers as well as set "new standards of competence for Halal certification that are aligned with the existing health, safety and quality-assurance projects in place in the mainstream food and beverage industry." (International Trade Centre, 2015) However, the existence of multiple, self-regulating Halal Accreditation Bodies can create added complications for independent Halal Certifying Bodies (HCBs). This results in fragmentation, complexity as well as the added costs of requiring duplicate certifications in order to be recognized in different regions in the global Halal market. (International Trade Centre, 2015)

In the interest of establishing Halal best practices and processes, Halal Bodies "cannot act as both certifier and accreditation agency; they need to be one or the other to avoid conflicts of interest." (International Trade Centre, 2015) Key to the success of developing a more open and transparent global Halal market is for there to be a standardized framework where accreditation of all other Halal Bodies is independently evaluated against to ensure impartiality and competence.

Numerous instances of fraud and bad actors within the Halal market today reduce consumer confidence and importantly highlight the lack of transparency and visibility around Halal certifications and processes. This strengthens the argument that a standardised and unified framework is necessary to better regulate and maintain oversight of the Halal market. It is also noted that this framework is long overdue. (International Trade Centre, 2015) Halal Authorities must progress from self-regulating, independent silos and move toward a unified and equally beneficial system wherein Halal can advance at an aggregate level. The key to building a common Halal ecosystem for all is in a collaborative and mutually beneficial approach. A mindset

shift must occur where the motivations to building a better functioning Halal economy with higher levels of transparency and integrity lie in the mutual objective to better serve a global, not just regional, Muslim population.

There is a growing awareness of the need to implement a standardised Halal framework. Successful implementation thereof will result in reducing complexity and confusion, lowering technical barriers to entry and increasing consumer confidence and trust in Halal integrity. Regulatory reformation, the convergence to a standardized framework, will "promote investment, competition and innovation, and will protect consumer interests and expectations no matter who is ultimately providing the service." (ICC Commission on the Digital Economy, 2016)

OneAgrix has built a fully functional and decentralised Agri & Halal digital ecosystem, whose blockchain and IoT technologies work together to increase and maintain higher levels of trust and transparency through an end-to-end traceability solution. The OneAgrix nOS (network operating system) is a hub for open industry data exchange where data is used to increase and maintain higher levels of visibility over Halal integrity and compliance. OneAgrix's nOS can ultimately provide the impetus for the accelerated laying down and digital adoption of a standardised global Halal regulatory system in which HFSCs can better operate. The digital ecosystem was built around a strong and mutually beneficial purpose, to better serve the global Muslim population with a common ecosystem for all Agri & Halal industry stakeholders.

THE IMPACT OF A DIGITAL HALAL ECOSYSTEM

Cleo defines a digital ecosystem as a "dynamic, interconnected network consisting of internal solutions, applications and systems, along with external trading partners, suppliers, customers, third-party data service providers and all their respective technologies. A digital ecosystem necessitates reliable communication and interconnectivity among customers and trading partners, and when it is integrated, it allows enterprises to leverage new and legacy technologies and build automated processes around them." (Cleo, 2021)

Gartner defines a digital ecosystem as "an interdependent group of enterprises, people and/or things that share standardized digital platforms for a mutually beneficial purpose (such as commercial gain, innovation or common interest). Digital ecosystems enable you to interact with customers, partners, adjacent industries - even your competition." (Malavasi, 2017)

The digitisation and digitalisation of an economy is the converging of all its services, industry, technologies, regulatory systems and business models. An ecosystem approach provides the necessary tools to facilitate this digital transformation and results in balancing sustainable development of ecosystem participants through inclusivity and collaboration.

Every company today is a technology company. By extension, almost all companies will become participants within some or other digital ecosystem. As Forbes points out, "today, no company can make, deliver or market its product efficiently without technology." In today's non-linear and complex world, no business is able to compete

in the market on its own. To grow and prosper they must become willing participants within open, flexible and sustainable ecosystems. (Henderson, 2020)

For the Halal market, it is essential that participants tap into ecosystems that bring together buyers and sellers. Crucial to success is the ability to participate in and contribute to ecosystems that increase and maintain higher levels of Halal integrity, credibility and trust. Ecosystems have proven to deliver business value, resilience and stickiness and the ability to target connections and collaborate across platforms. (Henderson, 2020)

Henderson states that "digital platforms, as the heart of the digital ecosystem, automate the intermediary, broker or marketplace functions. Common examples are Uber for rides, Airbnb for accommodation and PayPal for payments. The purpose of a digital platform is to automate the matching of suppliers to customers, ideally in a manner that can be monetized. In addition, digital platforms need to exploit Metcalf's Law, which suggests that the value of a network is in direct proportion to the number of nodes or connected users." (Henderson, 2020)

Accordingly, the OneAgrix B2B trade platform exhibits the unique trait of tech-driven efficiency with the ability to support increased accessibility of global Halal trade by reducing technical barriers and addressing vulnerabilities and flaws in current Halal systems. Very few platforms allow a customer to have real-time knowledge about a products journey. Usually, the reach stops at the retailer or food distributor, instead of ultimately empowering the consumers of Halal. OneAgrix, as a cross-border trading platform, is at its core an ecosystem player, linking a broader Halal and technology landscape in the spirit of reducing friction and promoting increased visibility over Halal integrity and compliance. In this way it acts as an enabler and interest group for the benefit of all Halal market participants.

The catalyst to realizing the potential and sustainable growth of the Halal industry lies in generating advanced Halal data and using this data to enable a full traceability solution. Digital Halal data is the new oil that will support a more advanced Halal industry and it is the interoperability of digital ecosystems that will enable the use of this data to be maximized. Consequently, OneAgrix is expending all efforts to consolidate digital food data into a global Halal and Ag-tech brain trust. The ecosystem acts as a neutral equalizer, creating a nexus of open-source Halal food data and initiating the world's largest digital Halal and Agri-infrastructure project. Data is leveraged to increase Halal integrity and enhance B2B2C trade, as well as acting as an information interchange between the network of HCBs and other Halal Authority Bodies for the purpose of mutual recognition. AI and predictive analytics can use collated Halal data to canvas unifying terms across Halal standards for trade purposes, with enhanced monitoring of Halal compliance through anti-counterfeiting technology. The end result is to promote interoperability and interconnectivity of all Halal stakeholders within a standardized, globally accepted digital system.

Rejeb states that, "full traceability is regarded as a mechanism for ensuring stringent standards of food quality and safety, maintaining sustainability and lowering the overall cost of the supply chain. IoT technologies have the potential to play a crucial role in ensuring effective traceability within HFSCs and the integrity of food products throughout the entire Halal supply chain. IoT technology can significantly facilitate

food management, reduce complexities in traceability processes, and facilitate the tracking and tracing of food producers' information." (Abderahman Rejeb, 2021)
A strong, end-to-end digital platform nurtures the Halal ecosystem and ensures that it adapts and evolves alongside mainstream industry sector progression, and that the effects are long-lasting. However, ecosystem participation requires significant organizational change as well as an important shift in mindset. A robust and better-functioning global Halal system should not be an independent objective by some, but a holistic consequence of all Halal stakeholders working together. Ecosystem participation and success is predicated on the ability and willingness to collaborate with a host of ecosystem complementors and an outward-facing mindset of industry stakeholders.

WHY A DIGITAL HALAL ECOSYSTEM IS ESSENTIAL FOR LONG TERM SUCCESS

There are new technologies, entrants to the Halal market and business models. The question is how to holistically connect all current and new Halal participants within an end-to-end global Halal ecosystem. This is achievable through the cumulative adoption of all beneficial technologies, in addition to their integration, implementation and usage in Halal production and the greater social fabric. Technologies create efficiencies that ultimately equate to enhancing Halal integrity throughout the Halal food system.
OneAgrix's digital ecosystem is public so that progress and technological advancement in the global Halal economy is collaborative and shared among all ecosystem participants. Any Halal stakeholder is open to join, contribute and benefit to the OneAgrix digital ecosystem, be it for increasing reputation and signalling of Halal compliance, accessing Halal markets to trade more effectively or to offer complementary services that increase Halal integrity. This is the primary vision of OneAgrix, to create a common and effective digital system for the global Halal industry that exists to serve a global Muslim population as its most important goal. A digital ecosystem for Halal sets a baseline for how an advanced Halal industry should more effectively operate and maintains higher levels of transparency, integrity and trust therein.

THE HALAL INDUSTRY IN ITS BROADER CONTEXT

The Maqasid Al-Shari'ah is stated as, "the higher objectives of the rules of the Shari'ah, the observance of which facilitate the normal functioning of society by the preservation of order, the establishment of equality among people and enhancing the public good (maslaha); this implies avoiding actions likely to harm individuals and society. The intent, objective and purpose is to revere the law, achieve social and economic justice as well as elevate the welfare of society." (Institute of Islamic Banking and Insurance, 2020)

Maqasid literally means, "intent, objective and purpose with a desire to create harmony with others; this relates to welfare, interest, or benefit. The vital part of the Maqasid's objective is preserving public good, whereby it looks at the public good and welfare of society as a whole in relation to the consequences of the intentions and actions of individuals." (Institute of Islamic Banking and Insurance, 2020)

Within this broader context as an ideal of religious obligation, Halal is a moral code of conduct that encompasses the actions, deeds, food, appearance and speech, amongst others, of a Muslim. Linking this ideal within the global Halal economy necessitates that the outcomes from all Halal activities should be in line with the intrinsic purposes in the Maqasid Al-Shari'ah.

The UN General Assembly adopted the 2030 Agenda for Sustainable Development that includes "17 Sustainable Development Goals (SDGs) and 169 specific targets, encompassing the social, economic and environmental dimensions of development." (United Nations, 2021) "These aspirations for human dignity, and 'to leave no one behind', are mutual in purpose with the principles and objectives of development from an Islamic perspective in the Maqasid Al-Shari'ah." (Islamic Development Bank, 2015)

The SDG objectives that can be addressed via a digital ecosystem for the Halal industry are; "No poverty, Zero hunger, Good health and well-being (inherent in Halal production and consumption), Decent work and economic growth, Industry innovation and infrastructure, Reduced inequality, Sustainable cities and communities, Responsible consumption and production and Partnerships to achieve goals." (United Nations, 2021)

A digital ecosystem empowers economies by reducing the need for boundary spanners. Using data more effectively to generate trust directly between buyers and sellers links itself to trade that is fair, reducing inequality and exploitation and shifting the economic impact and growth of trade to the source, i.e., the farmer himself. A digital ecosystem provides the capabilities for OIC member countries to shift excess food production to those in desperate need. This reduces food wastage and/or losses and alleviates food shortages more efficiently. In this way the digital Halal ecosystem is used as a bridge between global communities and becomes the global standard and model for the world in feeding humanity. In this way, Halal is viewed as a necessary Corporate Social Responsibility activity and all Halal stakeholders and participants within the digital ecosystem are able to better coordinate efforts towards the Maqasid Al-Shari'ah and UN SDG objectives.

"Strengthening the means of implementation and revitalizing the global partnership for sustainable development" (United Nations, 2021) is one of the most important objectives in order address the rest of the SDG goals more effectively. Partnerships to achieve common goals is indicative of a willingness to come together and collaborate on projects across multiple stakeholders with an outward facing mindset. This is especially relevant within the fragmented Halal market where navigation of the complexities of regional or national Halal influences is arguably hindering global progression. The success of a global Halal digital ecosystem is in the willingness of all stakeholders to collaborate, partner and operate within a common environment.

ONEAGRIX GLOBAL POSITIONING

OneAgrix is positioned globally as a digital ecosystem for interconnectivity of food supply chains and cross-border trade. OneAgrix is leading multiple public-private partnerships with Governments, the International Trade Centre Geneva (ITC) and other industry stakeholders to better coordinate digitalisation efforts and to increase trade opportunities for ecosystem participants.

In Africa, Nigeria Feeds the World Initiative is a OneAgrix lead project to digitise and digitalise Africa's largest economy. The Initiative sees OneAgrix as the official technology and trading platform partner for Nigeria and is backed by the Nigerian Governors Forum, Manufacturer's Association of Nigeria, Nigerian Agribusiness Group, Horasis-Nigeria Economic Development Council, African Business Roundtable and Nigeria Investment Promotion Commission. Nigeria Feeds the World Initiative sees Nigeria's multinational food manufacturers, SME's and farmers in the Agri and Halal industry joining the OneAgrix ecosystem and trading directly on its platform. The Nigeria Cross Border Trade Forum will be the official launch under this initiative and is planned for October 2022.

INTEGRA-Guinea is the "Socio-Economic Integration of Youth (INTEGRA) Programme and centres around the development of technical and professional skills for Guinea's youth and industries. The programme is a joint initiative of the Government of Guinea and the European Union (EU) and focuses on strengthening the capabilities of local institutions by addressing their needs to better serve the country's private sector." (International Trade Centre, 2018) OneAgrix and the International Trade Centre have partnered under this program to digitise and create localized digital ecosystems for Guinea farmers and food manufacturers to increase their trade capabilities and opportunities.

Further to achieving the objectives of the "African Continental Free Trade Area" (AfCFTA), OneAgrix has partnered with African Agri Council (AAC), a pan African institution that promotes the development of sustainable food and agriculture in Africa. AAC has a mandate to develop and upskill 10 million farmers from 2021 to 2031. OneAgrix is one of the digital trade ecosystems that farmers under AAC development programmes will join in order to connect to global food supply chains and access trade opportunities. Similarly, OneAgrix is collaborating with African Farmers Association of South Africa (AFASA) in order to connect farmers in Southern Africa to the food system. OneAgrix's main goal in Africa is to provide the necessary digital ecosystem for African participants to access the global food system for trade.

The Bank Indonesia supported OneAgrix-Indonesia SME Development Project is working to digitise Indonesian SMEs and to connect the world's largest Halal industry to the rest of the world using OneAgrix as the trading platform and digital Agri & Halal ecosystem. Multinationals such as Switz Group and Nestle Malaysia have also joined the OneAgrix digital ecosystem and are trading directly on OneAgrix.com.

What has been realised as a result of this global pandemic is that the global food system needs more robust and better-connected food supply chains that are resilient and more adaptable to global disruptions. Key to advancing towards a more sustainable and resilient Agri & Halal ecosystem is the adoption of digital

transformational technologies that help to address vulnerabilities and flaws in existing systems and processes, and the willing collaboration as well as increased interconnectivity of participants.

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ORGANIZATION OF LOGISTICS AND PROCUREMENT CHAIN AND ENTREPRENEURSHIP IN ACCORDANCE WITH HALAL STANDARD

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Abstract
The term transport chain includes the sum of all flows in which the transported goods are in motion, starting from the suppliers of raw materials, through intermediaries - wholesalers and retailers, all the way to the final consumers. The transport chain also includes numerous services that also contribute to increasing the value of the product. What will be the concrete structure of the transport chain, first of all, depends on the characteristics of the product itself, which is required by the final consumer, and which must be offered by the manufacturer. At the same time, the demands of consumers are based on the characteristics of their way of life and lifestyle, including the demands imposed by religious beliefs. These are specific requirements that, for example, are imposed on the Islamic faith through Sharia law. It strictly prescribes what is permissible for Islamic believers (permitted goods, services or behaviors) and is called halal. When we consider the Halal standard and its application in logistics, it means that all members of the supply chain in the Halal product system must comply with Sharia law. It specifically imposes the need for halal certification; specific hygienic and sanitary premises. At the same time, the procedures must be controlled by specially qualified persons and organizations, which are accepted by Islam.

Key words: halal logistics; halal certificate; organization of logistics, supply chain, control of compliance with halal standards.

JEL codes: H57

INTRODUCTION

Halal is an Arabic word that means allowed in translation, and is often used in the sense when something is socially or religiously "pure", with the proviso that forbidden (haram) cannot be changed to allowed (halal). The basic principle of halal is the permissibility of things, and the first principle is what Islam has established, that is, things created by Allah and the benefits that come from them are essential for human use and are therefore allowed. If in this case the product is authentic, or if it is not explicit in prescribing the ban, then the original principle of acceptability applies. Moreover, the area of haram in Islamic law, sharia, is actually very narrow, while the area of halal is wide to unimaginable limits. Only a number of credible and completely

clear textual records deal with prohibitions, while everything that is not mentioned as allowed or forbidden belongs to the general principle of the permissibility of things and to the domain of the generous mercy of God and His forgiveness.

Halal expects from the transport chain properly produced products, properly stored and properly transported halal products. Storage and transport imply a special room for halal products and means of transport according to the halal standard are usually separated from other products), which are both hygienically and sanitary accepted and controlled by organizational bodies accepted by Islam.

Due to the large number of requirements that extend throughout the transport chain, the paper defines these laws and processes that manufacturers, logisticians, carriers and others must comply with in order to meet all the requirements of this type of consumer. It should also be noted that if only one of the members does not follow the defined rules, the halal product will turn into haram (everything that is forbidden to Islamic believers), which is a sin of Islam and a crime of members of the transport chain. which, of course, will correspond to punishing a certain organization, ie the agency responsible for the actions of the members of the chain.

Due to the way in which the diet is prescribed and made according to religion, it is necessary to adjust the whole process of placing this product on the market to different requirements, so that members of these religions have as much offer on the market. The processes that can be located within the transport chain, which are also adapted to the Halal standard, will be described in more detail below. It will also state and describe which products are offered on the market, which are produced, stored and transported in accordance with halal, as well as which all conditions must be met in order for the product to be halal and as such presented to the market.

HALAL STANDARD

Halal standard means a document that establishes halal and haram. According to halal, among others, the following products are not allowed, such as: pork, blood, alcohol, meat of dead animals, carnivores, donkeys, dogs, birds of prey and food prepared with wine, cakes with any type of alcohol, cakes that contain emulsifiers, is not allowed. pork or animal fat base etc.Thus, the standard prescribes criteria for implementation, certification and verification of application requirements. Most of the requirements of the Halal standard are identical to the Hazard Analysis and Critical Control Point (HACCP) and the International Organization for Standard (ISO) 9001 standard, which organizations that have established some of these two systems enable easier preparation for halal certification.The Halal standard states:

- what is allowed and what is forbidden to members of the Islamic religion;
- how the application of the provisions of the Halal standard is certified and verified;
- how halal meat is processed;
- how halal products are labeled;
- which are halal additives and which are not.

Halal certification is applied to various products and services, such as: food, cosmetics, medicine, clothing, footwear, furniture, tourism and hospitality, shipping,

banking. Although it is mostly used in the food, pharmaceutical and cosmetic industries.

It is also important that machines, production lines for processing halal food and tools must also not be manufactured from non-halal materials, nor contain any non-halal materials. Also, the oil used for technical maintenance of machines and plants must not contain non-halal ingredients. Measuring and testing devices must be calibrated. Finally, during storage and sale, halal food must be categorized and labeled as halal.

If halal products are cited as milk, this means that it provides the necessary nutrition, does not contribute to food-borne diseases, does not contain congenital pathogens and the growth of pathogenic microorganisms, without residues of veterinary drugs, pesticides and other chemical contaminants, and Islamic standards. For the safety and suitability of milk, good hygiene practice should be applied throughout the food chain, where HACCP carries out certain hygiene controls, which confirm the effectiveness of the product. In this process, producers from good agricultural, hygienic and livestock practice adapt to the requirements and communicate with control bodies that carry out controls during processing, distribution, transport and sale of products that are properly handled and stored according to the instructions of control bodies. as a legislative framework, infrastructures, trained inspectors and staff to audit relevant documents. Hygiene, sanitary and health safety of food are prerequisites for the preparation of halal food, and also the manufacturer must ensure constant control of the same. Halal food must be prepared, processed, packaged, transported and stored in a manner that complies with the hygiene and sanitary requirements of the CAC / RCP Code Commission. Codex Alimentarius Commission / Recommended International Code of Practice, and other relevant codes. The organization must establish a system of monitoring the processes related to the realization of halal products, which includes the Haram Analysis Critical Control Point (HrACCP - Haram Analysis Critical Control Point).

Furthermore, the provision of authentic food and other consumer products is mandatory for Muslims, and therefore the certification and certification of each item in terms of halal observance by the competent Islamic authorities, such as the Agency for Islamic Affairs (JAKIM - Jabatan Kemajuan Islam Malaysia)) extremely important. That is, Muslims eat food that is halal, i.e. Sharia - religious, spiritual, personal choice, and thoyyiban i.e. healthy - safe, clean, nutritious, quality, authentic. According to Sharia law, food that is allowed must meet certain conditions, namely:

1) that it does not contain animals that are not halal, or products from animals that are not according to Sharia law;
2) that it does not contain elements that are strictly prohibited by Sharia law;
3) it is safe and not harmful;
4) has not been prepared, processed or manufactured using equipment that is contaminated with items prohibited by Sharia law;
5) food (or its ingredients) must not contain human parts;
6) during preparation, processing, packaging, storage and transportation, halal food must be physically separated from other food that does not meet the requirements of halal standards, points or any other thing that is declared haram by Sharia law. The norms, ie documents that are necessary for the application of this standard are:

• Codex STAN 1, general standard (STAN - English Standard) for labeling pre-packaged food;
• CAC / RCP 1, an international code of practice of general principles of food hygiene is recommended;
• CAC / RCP 58, Code of Hygienic Practice for Meat,
• ISO 22000, food safety management systems - requirements for each organization in the food chain;
• ISO 22005, chain traceability in nutrition - General principles and basic requirements for system design and implementation.

Certificate on halal products or services or management systems of organizations is one of the ways to ensure that the product or service is in accordance with these standards, and the organization has implemented a system to manage relevant aspects of its activities, in accordance with its policy and in accordance with Islamic regulations.

Implementing halal in the category of clothing is compliance with Sharia law when providing services in the field of clothing (does not include any skin, hair or parts of haram animals or animals not slaughtered in accordance with Islamic rules) or those types of clothing where wearing them is prohibited or clothing with special signs, which defines a special group of non-believers, etc.

Implementing halal in the category of clothing is compliance with Sharia law when providing services in the field of clothing (does not include any skin, hair or parts of haram animals or animals not slaughtered in accordance with Islamic rules) or those types of clothing where wearing them is prohibited or clothing with special signs, which defines a special group of non-believers, etc. Requirements arising from observing Islamic laws regarding clothing and types of clothing for women and men, such as prohibited clothing for women and men (such as clothing containing gold, pure silk, decorative products such as a gold ring, a gold watch, gold button and gold spectacle frame, etc.), and in the case of other clothing such as shoes, belt, bag, etc., the existence of various parts of haram components of animals in the manufacture of clothing and textiles, and washing clothes with haram lotions or in contact with unbelievers or contain "unclean" material.

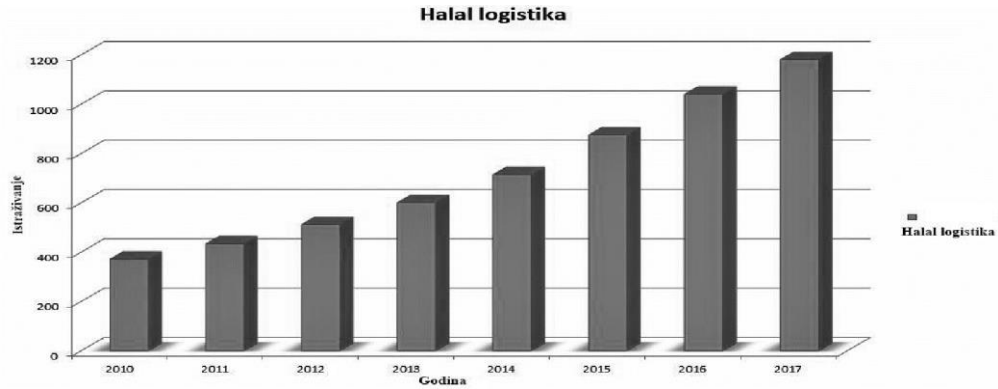
Of course, devices, accessories, machines and processing aids, ie processing lines, tools and accessories must be dedicated only to the production of halal. The product or its ingredients must not contain any components or products of animals that are not allowed according to Sharia law or products of animals that are not slaughtered according to Sharia law. And, the product must not contain anything in any quantity declared as haram. The product or its ingredients are safe and not harmful, and are prepared, processed or manufactured using equipment and facilities that do not contain haram. When packaging and labeling devices, accessories, machines and processing aids used for the processing of halal cosmetic and personal care may not be made or contain materials prescribed by Sharia law as haram, and used only for halal cosmetic and personal care. As well as appliances, utensils and machinery that have been previously used or have been in contact with the haram must be washed and ritually cleaned as required by Sharia law. This procedure is supervised and verified by the competent Islamic body. After conversion, the line will only be used

for halal cosmetic and personal care. Returning the line to the haram line and back to the halal line is not allowed.

APPLICATION OF HALAL STANDARD IN LOGISTICS

In 44 countries around the world, only those products produced according to Sharia rules are allowed to be consumed, and the total number of consumers of the Islamic religion in those countries is over 1,200,000,000, with Muslim minorities in other countries. data from 2009 (Martinović, 2012). From the above, it can be seen that the fastest growing world market is the halal market, which in 2005 had a total turnover of 550 billion dollars, of which 150 billion fell on food products, while in 2006 the turnover increased to 210 billion dollars.
The growth of this market can also be most easily presented through historical statistics, which in Graph 3 show the potential interest of today's population in halal logistics. Thus, the data refer to the Internet search of halal logistics in the period of seven years, ie from 2001 to 2017.

Graph 1. Presentation of the population's interest in halal logistic



Source: https://www.scribd.com/document

As the halal market is one of the most promising markets, despite the global crisis, it has grown to 40% in recent years, while in the next ten years it is expected to grow by 20 to 25%, and can be divided into:
1. Arab-Islamic market
a. rich countries (Qatar, Kuwait, Saudi Arabia, etc.)
b. middle rich countries (Libya, Turkey, Malaysia, Indonesia, etc.)
c. poor countries (Kyrgyzstan, Tajikistan, Guinea, etc.)
2. Halal market of Europe
3. Regional halal market.
As halal logistics is a new phenomenon, in modern conditions there are several logistics representatives who have a halal certificate, mostly in Malaysia, Thailand, Singapore, the Netherlands and France, which is a long period of logistics

organization on a global level. The halal highway initiative began in Malaysia as the signing of memoranda in Asia, Europe, the Middle East and the USA, which requires more global involvement from the food industry, logistics services, retail chains, halal authorities, universities and governments developing this global collaborative networks in the coming years. The emergence of the global halal market as a new sector of growth in the global economy and increasing performance in developed countries, speaks of the rapidly growing economies of Asia, the Middle East, Europe and America. With a growing consumer base, the halal industry hopes to become one of the competitive forces in world international trade. It should also be noted that Croatia has the greatest readiness and advice for the standardization of the halal industry, which is perhaps surprising.

The world's halal leader is Nestle, which exports its products from Malaysia to more than 50 countries, with exports amounting to more than $1 billion in 2011. This company is the first multinational company to seek and receive halal certification for all its food products. Since 1994, Nestlé Product Certification ensures that products are manufactured, imported and distributed under hygienic and sanitary conditions in accordance with the Islamic faith. All products and production facilities of this company have been inspected, so they have deservedly received a halal certificate, which was awarded to them by recognized Islamic certification organizations. The halal logo is also on the packaging of this company's products, as a confirmation that the products are prepared according to "strict Islamic requirements". Nestle has a unique position and history in the world market as far as halal is concerned, and thus has earned the presence of the company at halal online events (such as HFCE - Halal Food Council of Europe, in Brussels). This socially responsible company has started seriously producing and exporting halal products on the global market. At the end of the last century, more precisely since 1997, the company implemented a plan to provide customers with "global access" to halal products. In modern conditions, Nestle has 86 halal certified factories around the world, with halal standards. In addition, more than 1,200 small and medium-sized enterprises are included in Nestle's corporate social responsibility program, which aims to build halal knowledge and skills in all aspects of business, starting from productivity, marketing, quality assurance and performance measurement. . The production of this company is certified by JAKIM in Malaysia, but also by other credible bodies for halal certification for products that are produced outside Malaysia.

Also, Nestlé does not use alcoholic beverages at all, although ethanol needs to be used as an aid in the process (eg to extract flavor), but this does not have to come from alcoholic beverages, which is also referred to as "best practice" (Fisher, 2016).

As large retail chains in the world today have their own standards and insist on their own quality standards, companies that work for them are working to meet these requirements by placing their products on their market. As for halal products, most retailers keep special shelves designed just for them. Also, in Croatia today, large retail chains, such as Getro, have special places for halal products. The Halal standard clearly defines the procedures for halal certification, which is registered with the Institute for Standardization of Bosnia and Herzegovina as a national standard called halal food - requirements and measures, BAS 1049: 2010. Halal standard is compliant with other international standards of management systems (ISO, HACCP,

International Food Standard (IFS - International Food Standard), British Retail Consortium (BRC - British Retail Consortium), GLOBAL GAP and others (Krešić, 12).

In terms of transport, the dream principle is to ensure the physical separation of halal goods from non-halal goods in transport. In this way, mutual contamination is avoided, the possibility of error is avoided, the coherence of the transport system is ensured, in order to deliver the product according to the expectations of Muslim consumers, but also organizations, such as the International Halal Logistics Standard (IHIAS), 2009. This means that halal logistics involves the inclusion of excellence in the supply chain throughout the entire process, starting from construction, production and distribution to the final consumer. When a manufacturer puts the halal logo on the product packaging, it also means a confirmation of the promise that the collection of raw materials, production and distribution of products are in accordance with halal standards. Under these conditions, the consumer can reasonably expect and assume that the manufacturer takes care to ensure halal compliance throughout the supply chain, including the transport chain. This means that there is a need for special halal warehouses. In this sense, halal logistics requires key performance indicators (KPIs) to maintain and control the conditions of the entire supply chain. Multiple checkpoints may be required to ensure everything is halal compliant. For example, monitoring and control can be very helpful (Bruil, 2010).

All halal food stored, displayed, sold or served needs to be categorized and labeled as halal during transport and in particular, at each stage of the supply chain, to prevent mixing and contamination with non-halal materials. Hygiene, cleanliness and food safety are the main prerequisites in the preparation of halal food products. In modern conditions, halal products are prepared, processed, packaged, transported and stored in accordance with the hygienic and sanitary requirements of Codex CAC/RCP 1 and other relevant Codex and other international standards. At the same time, the materials used in hygiene must satisfy the use in the halal food sector.

The packaging of halal food is done in an appropriate way using packaging materials that meet the conditions, packaging procedures must be performed in a clean and hygienic manner with compliance with sanitary conditions, and temperatures that meet the safety and quality of the product.

For the above reasons, the fact is that there is a possibility that halal logistics will increase the company's operating costs. On the one hand, halal logistics is becoming more and more popular and interesting among logistics service providers because halal logistics promises a lucrative business, but on the other hand, few such providers offer total halal logistics services because it causes additional costs, which complicates the process of halal logistics (Sizwan Ab Talib , 2014). New problems also arise with the globalization of supply chains: supply chains for halal products are becoming more complex and more susceptible to contamination with non-halal products. Some halal scandals have already proven the vulnerability of supply chains for halal products, primarily food, so the halal issue is escalating into a major crisis for halal brand owners. Therefore, it gradually weakens consumer confidence in the halal brand.

So far, there have been relatively few academy guidelines on halal security. Therefore, there is a need for theoretical construction where scientists would apply halal supply

chain management to develop practical tools and methods for success. By implementing an integration model for better organization of halal supply chain networks, halal product owners could use them as a model for better organization of supply chain networks that provide a higher level of halal security (Tieman, Darun, 2015).

In addition to halal, the Islamic religion also strongly emphasizes purity (toyyiban) - in spiritual, physical, mental and health contexts. Halal management regulates and manages halal standards. Management includes the entire flow, starting from the source of raw materials (or origin of raw materials), transportation and distribution processes from the source to the market and to the end users. This system includes carriers, containers, transportation routes by land, sea or air, then warehouses and distribution centers and operators; wholesalers and retailers and their business up to the very end of delivery to consumers in hypermarkets, supermarkets and small establishments that must also be accredited in accordance with the halal certificate. All of the above are tasks of control by the management of the halal supply chain.

In addition, the Halal supply chain must also accept the conventional supply chain, but while respecting the legal requirements of Sharia. The imposition of Islamic laws in supply chain management acts as a basic requirement for a Shariah-based halal management process: meaning that everything must be halal (permissible) and also along the entire logistics chain. To recap, halal refers to cleanliness, hygiene, safety and integrity (MS2400: 2010). A good example is Malaysia which is globally recognized for pioneering halal supply chain management standards, which the MS2400 guarantees for halal channel standards, as shown in Table 1. (Noorsiah, Sariwati, 2016).

Table 1. Cleaning requirements according to MS2400 standards

Clause	MS2400: 2010, Part 1 - Halalan-Toyyiban safety channel, management system requirements for the transport of goods and / or cargo chain services
6.1.1	The design and layout of the premises should allow for good hygiene procedures, including the protection of goods / cargo against cross-contamination between and during operations. The construction and appearance of the warehouse must allow for adequate maintenance and cleaning.
6.1.2	The internal structure of the space should be solidly constructed of durable materials that are easy to maintain, and can be cleaned and maintained by disinfection or performing Shariah cleansing rituals.
6.2.3	Management shall provide all equipment used in the activities of the transport chain, meet certain requirements and be appropriately designed, constructed and installed to facilitate maintenance, adjustment, cleaning and use.
6.5.1	Equipment must be maintained in good condition to facilitate all remediation procedures including sharia ritual cleansing, and to prevent contamination of goods / cargo with unmanned materials and hazardous materials.

6.6.1	The organization must establish and maintain a procedure that describes suitable cleaning methods and materials, depending on the nature of the organization's business, describe the cleaning and disinfection programs undertaken to ensure that all parts of the premises are adequately clean and in accordance with halalan-toyyibana requirements. The cleaning program should include cleaning of cleaning tools and sharia ritual cleansing where necessary.

Source: https://sbr.journals.unisel.edu.my/ojs/index.php/sbr/article/view/13/21 in MS2400: 2010 Halalan - Toyyiban Assurance Pipeline (Department of Standards Malaysia, 2010).

ORGANIZATIONS OF TRANSPORT CHAINS IN ACCORDANCE WITH THE HALAL STANDARD

It has been established that the transport chain is a set of technical, technological, organizational, spatially and temporally synchronized operations that may include packaging, signing, weighing, counting, consolidation, loading, unloading, transhipment, storage, handover, on the type of product the company deals with. The greatest influences on the structure of chains, as described in the paper, are given by the product itself, which is demanded by consumers, ie their way of life. Therefore, a diagram of one food halal supply chain has been made, to show the participants and the procedures that can be found in one such chain.

Namely, the concept of halal food represents quality, safety and hygiene in order to ensure the concept of 'Halalan Thoyibban', ie what is allowed throughout the halal chain. The focus on halal products is given to halal food, and therefore an example of a halal food chain is given. In modern conditions, the halal food logistics distribution sector is not only considered an industry that meets strict religious requirements. Today, it has become a global economy, and many countries have realized the importance and involvement in meeting halal standards. In addition to Islamic believers seeking halal products, halal food can also attract the rest of the population because of products with added features nd added value of healthy, safe, hygienic food products, without contaminants (Zaharah, and et all, 2016).

Furthermore, the shipment of the product according to the last stage of the chain, ie, depending on the characteristics of the product that require as long or as short a chain as possible, the product is transported to a distribution warehouse or directly to stores / end customers. If there is a need for a long supply chain, the product is transported to a distribution warehouse that represents an intermediary in the chain, for value added services and further organization so that the product reaches the end user at the right time, in the right place, at the lowest cost.

ORGANIZATION OF HALAL TRANSPORT CHAIN OF LOGISTICS COMPANIES

Once the product is packaged and adequately labeled, it is ready for further ventures that take place during the product's journey to the final consumer. If the product does

not require direct, outpatient delivery, the next step will be in the warehouse of a logistics provider.

These warehouses can be divided into, raw material warehouses, semi-finished goods and components warehouses, finished goods warehouses, consolidation centers and transit warehouses, transitional warehouses, cross-dock centers, sorting centers, warehouses for e-distribution goods, warehouses for goods in return-return centers and warehouses of public sector institutions. However, the first three mentioned warehouses can be within the manufacturer. It can also be seen from these warehouses that they differ according to the characteristics of the product and its degree of production and finishing.

Therefore, it is necessary that the warehouses of raw materials be close to the place of production, and serve to store raw materials and components needed by the manufacturer to produce his product. Warehouses of semi-finished products and components are used to store products in different stages of production, and even the process of finishing the product before delivery to the end customer. Activities that may be present in this type of warehouse are, repackaging and product labeling; assembly of products from components, their packaging and shipping; adding specific components to a particular product; and equipping the packaging with special messages, advertisements, etc. Furthermore, finished goods warehouses store products that are ready for distribution to the final consumer and may be owned by manufacturers, operators, wholesalers or retailers. While consolidation centers and transit markets receive goods from different sources and create a shipment for an individual customer, ie. consumers or producers. This category includes "Just In Time" (JIT) warehouses, but also warehouses for the supply of macro stores, where there is also a difference compared to cross-dock warehouses, because the goods in consolidation warehouses can be kept for a certain time . In transitional warehouses, goods are received in large quantities from suppliers and then transformed into packages of quantities suitable for further distribution. Cross-dock centers have evolved in response to customer demands for faster delivery and more dynamic flow of goods through the supply chain. Goods passing through such a working principle must meet certain requirements, in particular labeling requirements. Goods are also received and identified at these centers, followed by the formation of consignments and their dispatch, with the aim of keeping the goods in storage for as short a time as possible. Goods that are suitable for their characteristics for this type of center are goods with a relatively short shelf life, such as fruits, vegetables, meat, fish and the like. This is followed by sorting centers used in parcel distribution or pallet distribution. At these centers, goods are collected from different locations, sorted according to the place of order, consolidated and shipped to the final consumer. A similar system is used in some systems for the distribution of goods on pallets, where goods are received on a pallet, removed from the pallet, and a new shipment is formed, which is shipped to the final consumer after these procedures. E-distribution warehouses have developed with the growing share of e-commerce, where large numbers of individual orders are handled, and the principle of operation is very similar to a sorting center, with a difference in input unit size and higher returns than usual in other types of distribution. . This leads to a warehouse for returnable goods, where supply chain operators are forced to pay more attention due to the increase in returned

products caused by e-sales, and the tightening of environmental standards. In this specific form of storage, goods are inspected, sorted, repackaged if necessary and then routed to a specific return logistics channel. These, as specific warehouses, are warehouses of public sector institutions that are not actually intended for storage of goods in the supply chain system, but store goods used in public systems, such as military warehouses, warehouses, warehouses in case of natural disasters and other.

THE FUTURE OF HALAL ENTREPRENEURSHIP AND MARKETS

In the past year, the halal-based economy has experienced faster growth, fueled by significant investment, new products and regulatory improvements. How do these events continue, where would the halal be in 2030? This chapter presents possible results and assumptions of what will happen to the halal market. The halal market in 2030 represents one mature sector that has exceeded 1 trillion USA.

The future of halal products - By 2030, the halal-certified food and beverage industry is expected to reach $415 billion, which is estimated based on total Muslim consumption of halal products and increasing certification across Muslim and non-Muslim countries. Private equity will play a key role in creating a leading company that will capture significant market share. However, today the halal product industry is still very fragmented, despite several leading multinational halal companies, which generate more than a billion dollars in revenue. Included in this industry are smaller companies that earn less than $100 million in annual revenue.

The future of Muslim businesses - Muslims are a strong consumer segment representing a quarter of the world's population, linked by shared ethical values derived from their faith, leading the global halal of economic market potential. Consumers are connected together with their fundamental Islamic values, which dictate their way of life and pass them on to shopping behavior. It is this segment of companies that they use to expand their business and make extra profit. In 2030, an exporter from Muslim countries will appear in the global trade of halal products and will challenge the leading positions of Brazil and India because they have all the predispositions to achieve that. Of great importance for all Muslim countries is a strong halal certificate that allows them to enter the halal market without hindrance.

The future of halal regulation - There are more than 350 certifiers worldwide, but halal regulation still lags behind other segments of the food industry. If current accreditation initiatives are implemented, regulation of the halal industry will be significantly improved (the International Halal Accreditation Forum has launched a process that could reduce the number of certifiers but improve the quality of overall trust in certified products). New certifiers will become more sophisticated, with leading certifiers expanding the range of organic products and creating the ultimate "Halal organic" certificate.

The Future of Muslim Banks - Islamic banking turnover has already reached $1.6 trillion in total assets in 2016, but continuing its current growth of over 10% annually. forecasts for the year 2030 show that the market would exceed 3 trillion dollars with over 2% share of the world's commercial banking

As activity increases, leading companies are likely to follow the path of global banks, entering a wide range of financial services, including trade, commercial and advisory services, tourism, and many other sectors. The banking sector is already showing promising signs for the development of halal-certified banks.

The Future of Muslim Finance - Today, Muslim finance is dominated by the GCC countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, UAE) and Malaysia, the dynamics of Islamic finance will change as non-GCC countries become involved. As the market grows, a system will emerge in which education and global exchange will be a critical component. Future financial centers will be Toronto (Canada), London (Great Britain), Dubai (UAE), Karachi (Pakistan) and Kuala Lumpur (Malaysia).

The Future of the Muslim Lifestyle - Online booking sites serve as a key access point for Muslim travelers looking to connect with businesses and homeowners. In addition, it is announced that multi-billion dollar halal fashion companies will be created. Halal media and entertainment companies can also become global conglomerates backed by government funding. Media companies can appear with different genres and formats.

CONCLUSION

The concept of halal is not limited to food itself. Halal products but also services include cosmetics, medicines, clothing, financial services and even tourism. It is also important to accept the fact that Halal-certified products are easily accepted by Muslim consumers, but also by consumers of other religions, because halal insists on a certain level of hygiene, sanitation and safety, which is a positive reaction for all consumers. It was noticed that there is a difference among consumers in non-Muslim countries, because they do not attach so much importance to labels on the packaging, and are not sufficiently informed about this form of product. If they were additionally instructed in the whole process, which extends from the procurement of raw materials to the customer, which can be achieved e.g. market surveys, product promotions, etc., would most likely increase the sales of halal products, which would encourage industry and retail chains to focus their business strategy in this area.

As already mentioned, Muslim companies in the halal product supply chain are based solely on trust. A Muslim will buy products from another Muslim, making the seller responsible to God for ensuring that the food he sells is halal, so the buyer has enough confidence in terms of consuming halal food. On the other hand, an important foundation of trust is the halal certificate, which is displayed on the product in the form of a label on consumer products or in the form of an output (marking of transport units). A prominent sign on the packaging that the product is made in accordance with the halal standard is a sign of trust that guarantees that the product, its raw material and the item have been verified by an independent Islamic certificate that must be in accordance with Sharia, the religious law of Islam. This mark also provides assurance that the entire supply chain is Shariah compliant, tested and certified by Islamic Certification.

A halal logistics supply chain is able to protect a halal product from contamination in all possible situations where goods move from producer to consumer. Given that durability requires preventive measures in segregation, such as mixing halal and

haram products for example. single pallet, in storage and transportation, as well as in complex container logistics (such as temperature regime deliveries), are important performance indicators that include halal storage and halal transportation. The effectiveness of the logistics halal supply chain is reflected if its indivisibility with each link of the chain is in accordance with the prescribed standards, which is possible through halal certification. In terms of efficiency, it is important to ensure low costs and high availability of halal food products for Muslim consumers, which has a stronger impact on Muslims living in non-Muslim countries. Logistics that extend halal integrity from source to point of purchase play a key role in developing the sustainability, efficiency and effectiveness of the logistics halal supply chain.

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HALAL TURIZAM I ODRŽIVI TURIZAM

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Apstrakt
Prema Svjetskoj turističkoj organizaciji (UNWTO) održivi turizam se definira: “kao turizam koji u potpunosti uzima u obzir trenutne i buduće gospodarske, društvene i okolišne učinke, brine se o potrebama posjetitelja, sektora, okoliša i destinacije“.
Pa tako i halal turizam zauzima sve značajnije mjesto u ukupnom turističkom prometu dok se s druge strane sve veća pažnja u svijetu posvećuje održivom turizmu.
Stoga je cilj u ovome radu analizirati razvoj halal turizma i održivog turizma, njihove sličnosti i različitosti odnosno da li se pod održivim turizmom podrazumijeva i halal turizam.
Halal turizam predstavlja turističku ponudu u prvome redu namijenjenu muslimanima u kojem se minimalno trebaju zadovoljiti dva uvjeta, a to su mogućnost obavljanja molitve i halal hrana.

Ključne riječi: halal, održivost, turizam.

HALAL TOURISM VS SUSTAINABLE TOURISM

Abstract
According to the World Tourism Organization (UNWTO), sustainable tourism is defined: "as tourism that fully takes into account current and future economic, social and environmental effects, addressing the needs of visitors, sectors, the environment and destinations".
It is well known that halal tourism occupies an increasingly important place in the overall tourist traffic, while on the other hand, increasing attention in the world is paid to sustainable tourism.
In this paper, we analyze the development of halal tourism and sustainable tourism, their similarities and differences, ie does sustainable tourism also mean halal tourism.
Halal tourism is a tourist offer primarily intended for muslims, in which at least two conditions must be met, namely the possibility of performing prayers and halal food.

JEL codes: Z3

UVOD

Poznata je činjenica kako halal predstavlja dozvoljeno ili dopušteno u prvome redu muslimanima od rođenja do smrti. Pa tako danas govorimo o halal stilu življenja, halal hrani i prehrani, halal tržištu, halal turizmu itd. Halal također predstavlja preventivno

- proaktivni sustav s ciljem zaštite ljudskog života, zdravlja, dostojanstva i slično kao i odnosa prema podarenom životu i svemu što nas okružuje.

Kada govorimo o halal tržištu onda govorimo o ponudi proizvoda i usluga potrošačima koji razumiju što halal predstavlja. Halal tržište je globalno tržište koje se iz godine u godine sve snažnije razvija zbog rasta potrošača koji traže halal proizvode i usluge kao i njihove sve veće kupovne moći. Različite institucije specijalizirane za praćenje halal tržišta svake godine objavljuju vrijednost halal tržišta kao i procjene za naredne godine. Jedna od najpoznatijih institucija Dinar Standard u Izvješću o stanju globalne islamske ekonomije 2022. navodi kako halal tržište predstavlja kontinuirani rast, a u 2021. godini vrijednost tržišta je iznosila 2 trilijuna američkih dolara te obuhvaća sektore halal hrana, financije, turizam, moda, farmaceutski proizvodi, kozmetika, te mediji s islamskom tematikom. [1]

Turizam u svijetu predstavlja sve važniji segment za razvoj ekonomije i utjecaja na BDP. Dok se s jedne strane bilježi pozitivan utjecaj turizma na BDP s druge strane se propituje negativan utjecaj na okoliš i druge aspekte života živih bića. Stoga je u zadnje vrijeme održivost postala jedna od globalnih tema.

U ovome radu analiziramo i uspoređujemo halal turizam i održivi turizam koristeći se pregledom literature i sekundarnih podatka iz dostupnih izvora poput objavljenih radova, članaka i izvještaja.

HALAL TURIZAM

U temeljnim izvorima islama Kur'anu i životu posljednjeg poslanika Muhameda a.s. možemo pronaći brojne upute vezane uz putovanja vjernika.

„Putujte po svijetu da vidite šta je On iz ničega stvorio" [2] - citirani ajet ili redak iz Kur'ana jasno ukazuje na potrebu putovanja vjernika kako bi spoznao Božje blagodati. Iz potrebe putovanja bez obzira na motiv razvio se turizam, a turizam koji je prilagođen gostima koji traže halal se naziva halal turizam.

Halal turizam predstavlja sve važniji segment u sektoru turizma te mnogobrojne zemlje bez obzira da li se radi o većinski muslimanskim ili nemuslimanskim zemljama usklađuje svoje turističke usluge prema halal normama. Kako je halal način života tako su dva najvažnija segmenta koja se trebaju zadovoljiti u razvoju halal turizma, a to su ponuda halal hrane i mogućnost obavljanja molitve. Iako je naravno potrebno uzeti širi segment usluga u turizmu kao što su: spa i wellness, krstarenja, turističke agencije, zdravstvene itd.

Procijenjena potrošnja u halal turizmu u 2021. godini iznosi 102 milijarde američkih dolara, a očekuje se da će porasti na 154 milijarde u 2022. godini te dosegnuti 189 milijardi u 2025. godini. Većina gostiju sa halal tržišta njih 70% dolazi iz 15 zemalja. Iz 6 zemalja Arapskog zaljeva 37%, Iran i Turska 15%, 3 jugoistočne Azije 10%, 5 zemalja zapadne Europe 7% te ostalih zemalja 30%. [3]

Iako bi se podrazumijevalo da je sve halal u zemlji gdje većinu populacije čine muslimani mnoge zemlje značajno rade na razvoju halal turizma. Primjerice Turska u kojoj je 98% stanovništva čine muslimani razvoj halal turizma je započeo početkom devedesetih godina, ali je značajni zamah dobio u 2000-ima. Do 2002. godine u Turskoj je bilo svega 5 halal hotela, a danas ih je preko 200. U regiji Alanya koja

godišnje ugosti preko 3,5 milijuna turista zadnjih godina se sve više povećava broj halal hotela. Trenutni broj je 18, a većina njih su hoteli sa 5 zvjezdica. Najpoznatiji su Adenya Hotel & Resort, Bera Hotel Alanya, Wome Deluxe Hotel i Adin Beach Hotel. Također važan segment u razvoju halal turizma je da se isti proučava na dodiplomskim i poslijediplomskim studijima. [4]
Kako bi se priključio rastućem segmentu halal turizma u Japanu mnogi se hotelijeri i ugostitelji prilagođavaju zahtjevima halal standarda u kojem živi oko 100.000 muslimana. Zračne luke u Japanu poput Kansai i Narita su omogućili molitvene prostore i restorane s halal hranom dok je Japanska turistička zajednica izdala poseban vodič za goste s halal tržišta u kojem se nalaze informacije o restoranima s halal hranom, adresama molitvenih prostora, vremenima molitve, izletima itd. [5]

GOSTI S HALAL TRŽIŠTA

U islamu su jasno propisane smjernice za ljudski život kroz sustav dozvoljenosti (halal), a suština predstavlja prolaznost života na ovome svijetu i očekivanje vječnosti na boljem svijetu ukoliko se poštuju islamski propisi. Oni su usmjereni k postizanju dobrobiti i osiguravanju mira, stabilnosti i progresa ljudskog roda te izgradnja društva u kome su Božje blagodati ravnomjerno podijeljene po principu pravičnosti. Postoji pet načela koja uključuju očuvanje vjere, očuvanje života, očuvanje uma/intelekta, očuvanje bogatstva (resursa) i očuvanja sljedećih generacija. Održivi razvoj iz islamske perspektive je uspostava ravnoteže između okoliša, ekonomske i društvene dimenzije. To znači da su uravnotežena dobrobit potrošača, ekonomska učinkovitost, postizanje ekološke ravnoteže u okviru evolucijskog znanja i društveno interaktivnog modela koji definira socijalnu pravdu, milosrđe i zekat (izdvajanje točno određenog dijela imetka u dobrotvorne svrhe) dva mehanizma za smanjenje siromaštva. (6)
U istraživanju o pružanju usluga na temelju zahtjeva gosta muslimana provedeno od strane Crescentrating između ostalog navode se društveni ciljevi i iskustvo lokalne islamske zajednice. Jedno od ključnih načela islama je socijalna pravda. Uključuje svjesnost i empatiju prema sebi, drugima i okolišu. Društveni ciljevi uključuju mogućnosti poboljšanja životnih uvjeta lokalnih zajednica, zaštita okoliša, ekološki turizam te potaknuti svojom vjerom muslimani su svjesni društvene odgovornosti na svojim putovanjima. Iskustva lokalne islamske zajednice odnose se na jedinstvena iskustva na putovanju kroz posjetu džamijama i islamskoj baštini te interakciji sa lokalnim muslimanskim stanovništvom. (7)
Stoga možemo kazati kako prema islamskim propisima i gore navedenim istraživanjima goste s halal tržišta karakterizira odgovoran pristup održivom razvoju zasnovan na moralnim vrijednostima gdje su gosti svjesni potrebe očuvanja prirode i lokalne zajednice.

ODRŽIVI TURIZAM

Održivi turizam je nastao kao odgovor na negativne posljedice koje turizam uzrokuje kao uništavanje okoliša i iseljavanje lokalnog stanovništva. Prema Svjetskoj turističkoj organizaciji (UNWTO) održivi turizam možemo definirati kao turizam koji

u potpunosti uzima u obzir trenutne i buduće gospodarske, društvene i okolišne učinke, brine se o potrebama posjetitelja, sektora, okoliša i destinacije. Dvanaest ciljeva održivog turizma (tablica 1) opisano je u publikaciji Svjetske turističke organizacije (UNWTO) Učiniti turizam održivijim: Vodič za stvaraoce politika.

***Tablica* 1: Dvanaest ciljeva održivog turizma [8]**

Broj	Ciljevi
1	***Ekonomska održivost***: Osiguravanje održivost i konkurentnost turističkih destinacija i poduzeća kako bi bila u stanju dugotrajno napredovati i osiguravati korist
2	***Boljitak lokalne zajednice***: Maksimiziranje doprinosa turizma gospodarskom napretku destinacije uključujući lokalno zadržavan udio potrošnje posjetitelja.
3	***Kvaliteta radnih mjesta***: Poboljšanje količine i kvalitete lokalnih poslova stvorenih radi turizma i koje turizam održava, uključujući razinu plaće, uvjete rada i dostupnost svima bez diskriminacije na temelju spola, rase, invaliditeta ili bilo koje druge osnove
4	***Društvena pravednost***: Težnja uspostavljanju opsežne i pravedne raspodjele gospodarskih i društvenih koristi ostvarenih turizmom u čitavoj destinaciji, uključujući povećanje prilika, prihoda i usluga dostupnih siromašnima
5	***Zadovoljstvo posjetitelja***: Osigurati sigurno, zadovoljavajuće i ispunjeno iskustvo posjetiteljima, dostupno svima bez diskriminacije vezano uz spol, rasu, invaliditet ili bilo koju drugu osnovu
6	***Lokalno upravljanje***: Davanje prava glasa lokalnim zajednicama i njihovo uključivanje u planiranje i donošenje odluka o upravljanju i budućem razvoju turizma u njihovome području u suradnji s ostalim dionicima
7	***Blagostanje zajednice***: Održavanje i poboljšanje kvalitete života lokalnih zajednica, uključujući društvene strukture i pristup resursima, pogodnostima i sustavima održavanja života, a izbjegavajući bilo koji oblik društvene degradacije ili iskorištavanja
8	***Kulturno bogatstvo***: Poštivanje i poboljšavanje povijesnog nasljedstva, autentične kulture, tradicija i osebujnosti destinacija
9	***Fizički integritet***: Održavanje i poboljšanje kvalitete krajobraza, kako urbanog tako i ruralnog, i izbjegavanje fizičke i vizualne degradacije okoliša
10	Biološka raznolikost: Podržavanje očuvanja prirodnih područja i staništa te biljnoga i životinjskog svijeta i minimiziranje njihovog oštećivanja
11	***Učinkovito korištenje resursa***: Minimiziranje korištenja rijetkih i neobnovljivih izvora u razvoju i radu turističkih objekata i usluga.
12	***Čistoća okoliša***: Svođenje na najmanju razinu zagađenje zraka, vode i zemlje te stvaranje otpada koje uzrokuju turistička poduzeća i posjetitelji

Izvor: http://www.odrzivi.turizam.hr/default.aspx?id=4534

Istraživanje koje je provela Europska komisija o stavovima građana prema turizmu u zemljama članicama pokazuje da je 82% građana voljno promijeniti svoje navike u putovanjima kako bi potaknuli održivost. Pa tako njih 55% je spremno konzumirati domaće proizvode, 48% je spremno smanjiti otpad, 42% je spremno putovati izvan turističke sezone i 41% je spremno putovati u manje posjećena odredišta. (9)

Iz istoga se može zaključiti da su građani Europske unije itekako svjesni svoje uloge u održivom razvoju, jer na kraju krajeva trend održivog razvoja i jeste potaknut negativnim čovjekovim djelovanjem te uloga pojedinca nije zanemariva. Održivi turizam danas predstavlja suštinu razvoja turizma u svijetu.

HALAL TURIZAM I ODRŽIVI TURIZAM

U prethodnim poglavljima prikazali smo glavne značajke halal turizma i održivog turizma. Održivi turizam ima tri načela, a to su ekološki, gospodarski i društevno – kulturni segment i potrebno je uspostaviti ravnotežu između njih. Određeni islamski propisi koji predstavlju srž razvoja halal turizma zagovaraju i podupiru koncept održivog razvoja. Pa tako halal turizam zbog svoje vrijednosti pozitivno utječe na gospodarstvo destinacije koja ga razvija. Nadalje ukoliko uzmemo u obzir da najveći broj gostiju s halal tržišta dolazi iz zemalja Arapskog zaljeva koje su većinom pustinjske zemalje ti su gosti kako zbog islamskih propisa tako i zbog uvjeta u kojima žive izuzetno ekološki osviješteni. Također zbog bijega od velikih vrućina i halal stila življenja gosti izbjegavaju dolazak u jeku turističke sezone nego radije dolaze u pred i postsezoni te odsjedaju manje posjećenijim mjestima tražeći maksimalnu privatnost i poštivanje zahtjeva halal standarda. Jedan od važnih segmenata razvoja halal turizma kako smo već naveli je halal hrana gdje se većinom radi o halal certificiranim proizvodima domaćeg porijekla.

ZAKLJUČAK

U radu smo željeli prikazati temeljne karakteristike halal turizma i održivog turizma te usporediti sličnosti i različitosti. Iz svega analiziranog možemo zaključiti da halal turizam koji se bazira na vjeri Islamu u potpunosti odgovara načelima održivog turizma štoviše u određenim segmentima se postavlja kao imperativ stoga daljnim razvojem halal turizma u destinacijama koje ga razvijaju podupire se održivi razvoj.

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RESUME

Halal tourism represents an increasingly important segment in the tourism sector, and many countries, regardless of whether they are Muslim majority or minority countries, adapt their tourism offer to this growing segment. Since halal is a way of life, the two most important segments that need to be satisfied in the development of halal tourism are the offer of halal food and the possibility of praying. Although of course it is necessary to take a wider segment of services in tourism such as: spa and wellness, cruises, travel agencies, health services etc.

The estimated consumption in halal tourism in 2021 is 102 billion US dollars, and it is expected to increase to 154 billion in 2022 and reach 189 billion in 2025. Islam as a religion provides comprehensive instructions for human temporary life through the system of permissibility (halal), and the essence is the transience of life in this world and the expectation of eternity in a better world if Islamic regulations are followed. They are aimed at achieving well-being and ensuring peace, stability and progress of the human race and building a society in which God's blessings are equally distributed according to the principle of fairness. There are five principles which include preservation of faith, preservation of life, preservation of mind/intellect, preservation of wealth (resources) and preservation of future generations. Sustainable development from an Islamic perspective is the establishment of a balance between the environmental, economic and social dimensions. guests from the halal market are characterized by a responsible approach to sustainable development based on moral values where guests are aware of the need to preserve nature and the local community. Sustainable tourism was created as a response to the negative consequences that tourism causes, such as the destruction of the environment and the emigration of the local population. According to the World Tourism Organization (UNWTO), sustainable tourism can be defined as tourism that fully takes into account current and future economic, social and environmental impacts, takes care of the needs of visitors, sectors, environment and destinations. Certain Islamic regulations that represent the core of the development of halal tourism advocate and support the concept of sustainable development. Thus, due to its value, halal tourism has a positive effect on the economy of the destination that develops it. Furthermore, if we take into account that the largest number of guests from the halal market come from the GCC countries which are mostly desert countries, these guests are extremely environmentally conscious because of Islamic regulations and because of the conditions in which they live. Also, due to the escape from the high heat and the halal style of living, guests avoid coming in the the tourist season, preferring to come in the pre- and post-season and stay in less visited places, seeking maximum privacy and compliance with the requirements of halal standards. One of the important segments of the development of halal tourism, as we have already mentioned, is halal food, where the majority are halal-certified products of domestic origin. In this paper, we wanted to show the basic

characteristics of halal tourism and sustainable tourism and compare similarities and differences. From everything analyzed, we can conclude that halal tourism, which is based on the religion of Islam, fully corresponds to the principles of sustainable tourism, which is increasingly set as an imperative in certain segments, therefore, the further development of halal tourism in destinations that develop it supports sustainable development.

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MANUFACTURER'S AWARENESS OF HALAL PRODUCT (DRY VEGETABLE MIXTURE), PLACEMENT AND MARKETING

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Apstrakt
The aim of the research is focused on researching the perception of the quality of products based on dried vegetables, which influences the consumer to buy halal food products.
Three halal products based on dried vegetables DO-DO spice, Vegedor and Tajna-supplement to vegetable dishes were used for the research.
Halal product status was examined through composition, specification of raw materials, supervision of the procurement process, validation of the production process and verification of the composition of finished products. Hygienic-toxicological, technological, nutritional-physiological, sensory, and market-consuming quality factors were considered.
The content of iodized table salt as a basic carrier is different in the analyzed samples. The conducted analyzes determined that Vegedor and Tajna-supplement to vegetable dishes have a salt content of up to 56%, while DO-DO spice has a 60% content. If we compare the max. permitted content of salt in spices, we can conclude that Vegedor and Tajna - supplement to vegetable dishes have 4% less table iodized salt than allowed. By reducing the share of table salt, the producer focuses on the health of consumers if the WHO recommendation on the necessary reduction of daily salt intake is taken into account. The share of other raw materials in a homogeneous mixture is inherent in the nature of the spice produced.
The obtained results, determined HrCCP points indicate that DO-DO spice, Vegedor and Tajna, in addition to halal status, also have functional properties for the end user.

Key words: halal product, HrCCP, dried vegetable mix, quality factor.

JEL codes: M3

INTRODUCTION

With the increase in the need for halal products and the increasing trade in "halal" products, it is very important to accompany the proof of the halal status of foods. Halal food is defined as food permitted according to Islamic laws and must meet the following conditions:

- that it does not consist of anything that is prohibited by Islamic regulations.
- that such food has not been prepared, processed, transported or stored using any facilities and means that have anything prohibited by Islamic regulations
- that such food must not come into contact with any foodstuffs that do not meet Sharia requirements in the process of preparation, production, transport and storage.

At the level of Bosnia and Herzegovina, BAS 1049:2010 - Halal food - Requirements and measures was adopted, on the basis of which work systems are further defined. Enterprises, corporations, systems that strive for business excellence should be based on full quality management. In order to ensure the quality of food that is placed on the market, it is necessary to precisely define specific quality indicators. Quality factors that affect the evaluation of the quality of food products are hygienic-toxicological Qht, technological Qt, nutritional-physiological Qn, sensory Qs, market-consumer Qtp. Precise definition of elements and requirements within the framework of five quality factors, analytical testing, processing of results, and their documentation influence quality management (QM), which ultimately ensures product quality (QA). In the halal quality management system, the rules of procedure are a document in which all elements of quality are determined and briefly described according to the requirements of the Halal standard, HrACCP, with the possibility of changes and additions. Taking into account that three different products were considered in the paper, there is a separate Regulation for the management of the quality system for each company. Respecting and adapting to the measures and requirements of BAS 10049:2010 for each product, a hazard analysis for halal raw materials, process hazard analysis, determination of haram CCP points, display of hazard analysis and establishment of preventive measures, HrACPP control map, internal decision-making standard, report and decision on non-conformities.

MATERIALS AND METHODS

The research included three spices from As Holding's production line: DO DO spice, Vegedor and Tajna. The research period includes the annual production of spices with dried vegetables. The mixture of spices with dried vegetables is a homogeneous mixture with kitchen iodized salt. According to the ingredients shown in Table 1, table iodized salt represents the carrier of the finished product.

Table 1. Presentation of the ingredients of the considered spices

Name of the finished product	Share of NaCl (%)	Share of vegetables (%)
DO DO začin	Aproxx. 60 %	to 15 %
Vegedor	Aproxx. 52 %	to 13 %
Tajna	Aproxx. 56 %	to 16 %

In order to consider the overall quality of the product in order to analyze quality factors, microbiological analyses, sensory analyses, nutritional composition, consistency, viscosity and structure were performed. Analyzes were carried out through the company's daily laboratories, and verifications were carried out through external laboratories.
All raw materials used in the production process have halal status, which was confirmed by the hazard analysis itself. Iodized kitchen salt produced in Solana d.d. Tuzla is used as the basic carrier in the process of producing spices with dried burrs, whose chemical and granulometric composition is shown in Table 2 and Table 3.

Table 2. Sensory and chemical composition of kitchen iodized salt

Sensory analysis: salt dry, white without impurities, salt corresponds to the quality of salt etal. no. 1 (whiter salt > 95%)			
NaCl (%)	Ca + Mg (%)	Moisture w (%)	pH 20% solution
99,73	0,0005	0,03	Neutral

Determination of chloride is done according to the Mohr method, and determination of calcium and magnesium is done using complexometric titrations. Moisture was determined using a moisture analyzer MA xR, RADWAG.
To determine the granulometry of kitchen iodized salt and raw materials, a Haver&Boecker sieve and granulometric sieves were used.

Table 3. Granulometric composition of kitchen iodized salt

Diameter of granulometric sieves (Ømm)	0,5	0,4	0,3	0,2	0,1	Residue	Below 0.3
% of salt on a sieve	8,56	11,30	37,89	30,73	10,52	1,0	42,25

The share of raw materials in the portion of dried vegetables differs according to type when we examine all three considered spices, shown in Table 4.

Table 4. Product quality properties, composition and granulometry of dried vegetables DO DO spices, Vegedor and Tajna

Finished product	Composition of dried vegetables	Granulometry	Smell, taste, color
DO DO spice	Carrot, parsnip, onion, parsley leaf	from 2 to 3 mm	Characteristic
Vegedor	Carrot, parsnip, leek, onion, dried parsley		
Tajna	Carrot, parsnip, parsley. *Celery*, onion		

For tested spices based on dried vegetables, the HrACPP was established in the purchasing department, which means that no raw material can enter the process without being halal.
In order to investigate quality factors in the market from the consumer aspect, a survey of 40 respondents was conducted with a preferential review.

RESULTS AND DISCUSSION

In order to complete the research of spices with dried vegetables, the quality parameter, hygiene and toxicological factor is shown in the example of Vegedor spices in Table 5.

Table 5. Microbiological correctness of Vegedor spices

Parameter	Unit of measure	The result	Maximum allowed value	It fits
Enterobacteriaceae	cfu/g	<10	10^2	Yes
Mold	cfu/g	<10	10^3	Yes
Staphylococcus aureus	cfu/g	<10	10	Yes
Aerobic mesophilic bacteria	cfu/g	2×10^4	10^5	Yes
Salmonella spp	cfu/g	not isolated /25 gr	n.n./25 gr	Yes

Based on the results presented in Table 5, it can be concluded that the complete chemical-toxicological correctness/safety of the food is ensured for the spice in all aspects of the quality of the food product.
In addition to hygienic and toxicological requirements, the product must also meet technological quality factors related to the processing and processing of raw materials (dried vegetables), i.e. the production of spices with dried vegetables itself. The parameters that are important during the technological quality factor are: structure, consistency, color, water content.

Table 6. Technological quality factors of DO DO spices

Finished product	Structure	Consistency	Color	Water content (%)	It fits
DO DO spice	Dried vegetables, their mixture	Specific to the product	Yellow - greenish - characteristic of the product	1,55	YES – according to the defined product specification

Table 6 shows the results of the analyzed parameters in the considered factor of the technological quality of the finished product. Based on the results, we can conclude that it is a product that is inherent to the defined product specifications and meets parameters of the technological production process.
From the point of view of the consumer, the requirements from the group of nutritional and sensory factors have the greatest importance. Table 7 shows the nutritional values of all three investigated spices. Nutritional values are calculated values obtained by following the recipe of the finished product.

Table 7. Qualitative characteristics of spices

Qualitative characteristics		Tested spices		
		DO DO spice	Vegedor	Tajna
Look		Specific to the product	Specific to the product	Specific to the product
Smell		Specific to the product	Specific to the product	Specific to the product
Taste		Specific to the product	Specific to the product	Specific to the product
Average nutritional value per 100 gr.	Energy (kJ/kcal)	494/116	672/160	280/67
	Fats (g) of which saturated fatty acids (g)	0,25 0,02	0,50 0,1	0,00 0,00
	Carbohydrates (g) Of which sugars (g)	23,00 15,00	30,00 20,00	17,30 16,60
	Proteins (g)	5,50	9,0	0,28
	Salt (g)	64,75	52,00	65,61

Based on the results in Table 7, it is evident that the different composition of raw materials affects the energy value of the finished product. Vegedor seasoning has the lowest salt content at 52%, which represents a very important quality factor in the part of selection and consumption by the end consumer.
Sensory properties are inherent to the product itself, because it is a specific product that contains raw materials of different colors and a subjective approach. The method of sensory analysis is not applied as a method of valid data, because the measurements were not made in an organoleptic/sensory laboratory.
Market-consumer factors compared to the previously mentioned factors form a specific group of factors. They are primarily supply, demand and price of products, but also social structure, purchasing power, religious affiliation, customs of a certain area, acquired consumer habits are like one element.

Figure 1. Diagram of the decision to buy spices/spice supplements

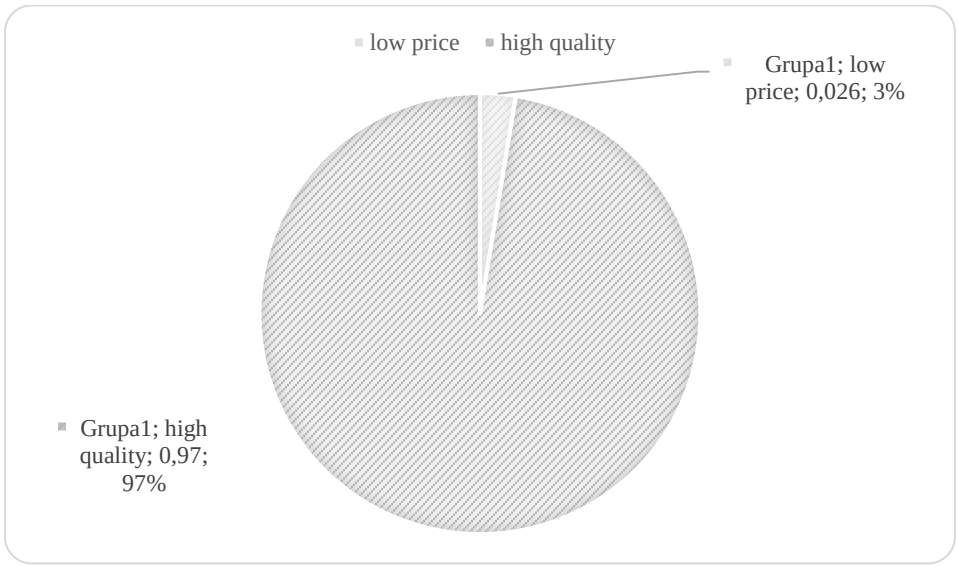
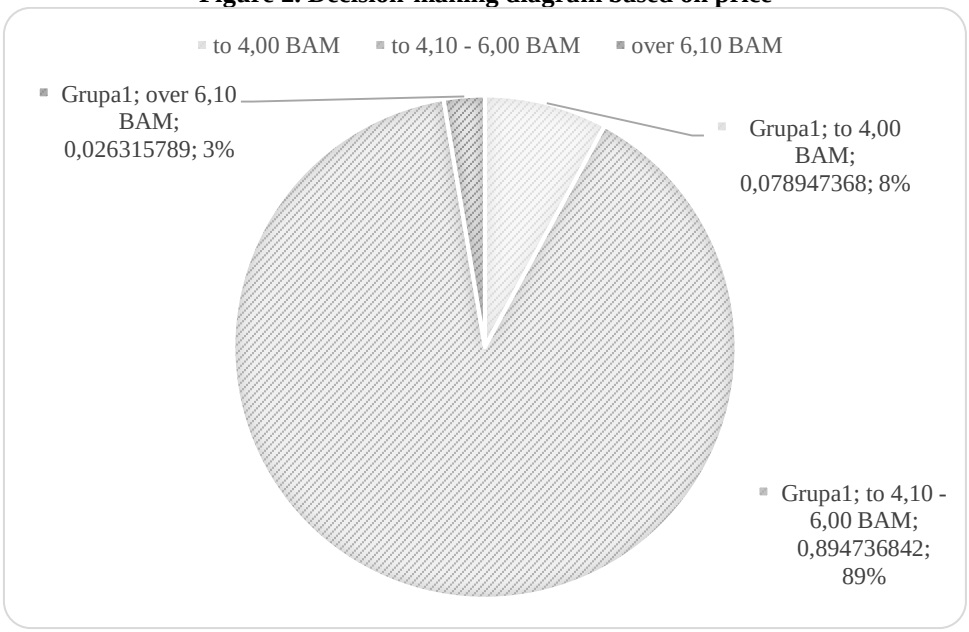


Figure 2. Decision-making diagram based on price



On the basis of Figure 1, we come to the conclusion that for the end consumer, in terms of the ratio of low price and high quality, quality, i.e. the healthiness of the finished product, is more important imperative. The price range from Figure 2 tells us that consumers consider the most acceptable price range between 4.10 and 6.00 KM for an example of 1 kg. seasoning with dried vegetables. If we look at the results of

the survey and the various factors that depend on the end consumers themselves, we can conclude that the market-consumer factor does not constitute the essence of quality, nor does it directly determine the selection and quality of the product.

CONCLUSION

Laboratory analyses, surveys, and consideration of quality factors were carried out in order to identify the awareness of the manufacturer and the actual marketing of the product on the market. On the basis of the conducted analyses, comparison with the requirements of the quality factors, it is possible to conclude that the final products produced by the members of As Holding meet the health safety requirements for the final consumer.

As haram, the critical control point for spices (dried vegetable mixtures) is the purchasing department/input control, i.e., no raw material can enter the producer's company in the process unless it has "halal" status.

DO DO seasoning, Vegedor and Tajna meet all the requirements of the quality factor, but in terms of nutritional value, there are obvious differences in energy values and in the proportion of NaCl salt. Vegedor has the lowest salt content at 52%. By reducing the share of table salt, the manufacturer focuses on the health of consumers if the WHO recommendation on the necessary reduced daily intake of salt is taken into account. The proportion of other raw materials in the homogeneous mixture is specific to the nature of the spice produced.

Through the conducted survey, we come to the conclusion that for the final consumer, in terms of the ratio of low price and high quality, quality, i.e., the healthiness of the finished product, is more important. The most acceptable price range is between 4.10 and 6.00 KM for example for 1 kg. seasoning with dried vegetables. If we look at the results of the survey and the various factors that depend on the end consumers themselves, we can conclude that the market-consumer factor does not constitute the essence of quality, nor does it directly determine the quality of the product.

Based on the obtained results, the established HrCCP points indicate that DO-DO spice, Vegedor and Tajna have functional properties for the end consumer in addition to halal status, and that As Holding accepts the quality of the end product as a strategic goal of growth and success.

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LAB-GROWN MEAT: A MODERN CHALLENGE IN FOOD PRODUCTION FROM THE JEWISH ASPECT

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Abstract:
The modern food industry is increasingly using the tools of genetic engineering in the production and sale of food products. One of the most important recent technological innovations is lab-grown meat (or "synthetic" meat). The lab-grown meat industry is based on the genetic duplication of animal cells under laboratory conditions in order to attempt to produce a product with the nutritional and culinary value of animal meat. Some predict that this industry will play an important role in the human diet of the future.
The beginning of this process is based on cells taken from live animals. In recent years, new methods of laboratory meat production based on non-meat cells have begun to develop. For example, in one of them, the cells are taken from a pre-embryo found in a fertilized egg (blastula). Otherwise, the cells are taken from a pre-embryo taken from a cow (blastocyst).
This topic raises various questions and many challenges in the fields of health, ecology, ethics and, of course, religion. How should we treat such meat? Is meat produced in a laboratory kosher? Is it Halal? Is the product meaty or synthetic? Do the initial stem cells determine the definition of the final product, and, further on, what is the status of such a product when it is produced from pig stem cells?
On the ethical level, a general question is posed on the subject of genetic engineering. Is it permissible to intervene so blatantly in the nature that God created?
This article will focus on the various challenges that this industry raises from the Jewish ethical and kashrut aspects, and address some questions.

Ključne riječi: meat, ethics, laboratory, industry, Jewish law.

JEL codes: Q18

INTRODUCTION

For many years, science around the world has been producing meat substitutes. The increase in population, and with it the increase in meat consumption, contributed to an unprecedented development in this study. Following the damage caused to the planet as a result of greenhouse gas emissions generated in the production processes of the meat industry, the research and this industry are receiving great support from environmental protection organizations.
The research process of growing artificial meat began about 50 years ago - with the success of Prof. Russell Ross, in 1971, to artificially grow muscle fibers. However, a significant breakthrough in the field took place about 10 years ago when a group of scientists in the Netherlands, led by physiologist Prof. Mark Post, from the University of Maastricht, succeeded in producing "meat" from stem cells removed from the

muscle tissue of a cow's neck. Stem cells differ from other cells in their ability to develop and form new tissues.
The researchers "fed" the stem cells fats, sugars and proteins and placed them on a seaweed substrate that causes them to stimulate, which leads to their reproduction. After many muscle tissues were created under laboratory conditions, a "meatball" was prepared from them with the addition of flavorings.
The main development led to the production of the first samples of artificial burgers which, unlike their predecessors, had a reasonable market price.
There are many dozens of companies in the world today that use different technologies, so the concept of "cultivated meat" is very general and each product needs a discussion on its own depending on the technology in which it is produced.
There are technologies whose development is not based on a mature meat cell from an animal, in one method the product is produced from cells (fibroblasts) that are used as part of the connective tissue of a pre-embryo (blastula) formed in a fertilized chicken egg. When the cells are soaked in a suspension, they cause some of them to replicate and some of them to differentiate into fat cells. The final product is a collection of fat cells and connective tissue cells that are very much identical to parallel cells found in birds.
In another method, the pre-embryo of an animal is washed from the fallopian tubes when it is in the "blastocyst" stage; and is made up of an inner nucleus of stem cells (from which the fetus is supposed to develop) and an outer shell (from which the placenta is supposed to develop). In this method, the replication process is two-step: in the first stage, the stem cells undergo replication within "bioreactors" that simulate the biochemical environment of the animal's body and cause some of them to differentiate as muscle cells and some to differentiate as fat cells; In stage two, the sorted cells are sown on top of plant "scaffolds" or blood base, and continue to replicate until tissue is formed.
There are technologies based on taking a mature meat cell from a living animal, from a slaughtered animal, from a kosher animal and from a non-kosher animal.
An in-depth understanding of the structure of the material and the various scientific-technological processes will enable the institutions in charge of public health and Kosher certification in each country to provide a correct and appropriate response. In this article, we will try to examine the ethical and kosher aspects of this technology.

I. GENERAL ASPECTS

The artificial production of meat in the laboratory is without a doubt one of the fascinating developments in the field of technology and food. This innovative development makes use of genetic technology and makes it possible to create meat from stem cells produced from animals and sorted into muscle cells. Scientists are working hard in various laboratories around the world to improve the technology and make it cheaper to make it economically viable. This development raises general questions and not just questions about the kosher status of food:

1. Relationship between Science and Jewish law

The question regarding the relationship and the gap between modern science and Halakha[i] is raised from time to time. Many even suggest that there is a contradiction between science and Jewish law. This unfortunately is a wrong understanding of characteristics of scientific theory and Halakha. While Halakha is made of law and ethics that characterize a way of life, including commandments dealing with proper behavior, prohibited food and much more. Science, is dealing with nature and the way it is function. Creating tools and technologies for the benefit of humanity. However, scientific technology in wrong hands can cause a disaster. The reason is simple, science is a tool and the use of it is a question of moral values. Therefore, technology and science as such do not and cannot contradict the moral values of Halakha.

Leading rabbinic authorities already started to examine the halakhic aspects of Lab-grown meat shortly after development of the technology production started. This issue raise many questions in Jewish law. First, one must determine the halakhik status of the "meat" to be able to determine is it kosher and therefore can be consumed and in which conditions. Many questions need to be clarified such as: Is Lab-grown meat considered meat? Do the stem cells determine the definition of the final product? Can it be used with dairy? Are cells that cannot be seen forbidden? The answers to these questions and others are not simple, and therefore there are different opinions between rabbinical authorities.

2. Human Intervention in the Affairs of God

The field of science raises a fundamental question. In the Torah, it appears that health conditions come from the divine providence as reward or punishment for our conduct in the world:

> *"If thou wilt diligently hearken to the voice of the Lord thy God, and wilt do that which is right in His sight, and wilt give ear to His commandments, and keep all His statutes, I will put none of these diseases upon thee, which I have brought upon Egypt: for I am the Lord that heals thee."(Exodus 15:26)* [ii]

Does these verses imply that medical treatment is an intervention in Gods providence? It is well known that members of some religions affiliations reject the use of medical treatment, since they see it as interference with "the will of God."

Jewish law, not only allow medical treatment, in many cases Jewish law considers medical treatment mandatory. The obligation to heal is derived from the verse: "Cause him to be thoroughly healed." (Exodus 21:19). Our Sages learned "Hence do we have permission to heal." [iii] From which we learn that it is an obligation to heal and save life, by no means is it an opposition to divine will. Furthermore, withholding treatment is equivalent to shedding blood. [iv]

The attitude of the Jewish law regarding the obligation to heal is explained in the following Midrash[v] as follows:

> *"Rabbi Ishmael and Rabbi Akiva were walking in Jerusalem together with another man. A sick person met them and said: "Gentlemen, tell me how I*

may be healed." They responded: "Take such and such and you will be healed."
After the sick person departed, the man who was accompanying the Rabbis asked: "Who caused his disease?" They answered: "The Holy One, blessed by He." He asked: "Why do you interfere in a matter which is not yours? The Lord did smite him; why then do you heal him?"
The Rabbis asked him: "What is your occupation?"
"I work the land. Here you can see my scythe," he an- swered. Then the Rabbis asked: "Who created the land upon which you work?"
"The Holy One, blessed by He."
"Then you are interfering in a matter which is not yours. The Lord did create the vineyard; why then do you eat His fruits?"
The farmer responded: "Do you not see the scythe in my hand? If I did not plow and weed and put down fertilizer, nothing would grow in the land."
"Fool," the Rabbis said, "a tree cannot grow if the land is not prepared. And if the tree grows, it will die unless fertilized and watered. Similarly the body of man must be tended by the physician with proper medication.". [vi]

The Midrash explain that the world was created with a system of natural law. However, humans are permitted to use the laws of nature for their health and well-being. It is therefore appropriate to engage in science and medical therapy for our health. [vii]

II. JUDAISM ON GENETIC ENGINEERING

As a matter of principle Judaism is very supportive of scientific developments that help humanity. In the creation of the world, God commands man: "fill the earth and master it" (Genesis 1:28), which the Sages interpreted as God's instruction for man to develop the world and perfect it.[viii]

Scientific and technological developments are also the realization of the special virtues that God created in man, thus expressing the dignity of man described in the book of Psalms:

"That You have made him little less than divine, and adorned him with glory and majesty;
You have made him master over Your handiwork, laying the world at his feet" (Psalms 8:6-7).

Various developments in the field of genetic engineering, if approved and successful, can allow us to choose the sex of the fetus, prevent diseases, and in our case, the development of meat for eating by using advanced genetic technology.

Genetic engineering with the help of acquired knowledge about the human genome makes it possible to save people by identifying various diseases and syndromes, but on the other hand, this knowledge may impair our free choice of how to behave, for example whether to marry or have children?

Genetics allow us to choose the sex of the fetus, however a choice might not always be affected and will be made for medical reasons. Is this what we want?

Another step is genetic intervention, i.e. gene modification and various gene manipulations, this step raises many ethical and not just halakhic questions.
The technology of genetically engineered meat production takes different cells and produces meat from them. The potential benefit is enormous, as the meat industry is known to be one of the biggest pollutants, it is an industry that consumes water resources and agricultural land in very large quantities, and of course there is the problem of animal cruelty. On the other hand, many ethical questions arise, such as the risks of genetic engineering, that is, the genetic engineering in these processes concerns the fundamental building blocks of the world.
Can this type of development lead to dangers that are difficult for us to anticipate right now? Furthermore, it is not possible to prove at this stage whether food produced with the help of artificial intervention in nature is safe from a health point of view. Therefore, this issue requires great caution.
Below we will examine the various considerations regarding the use of genetic engineering technology for meat production.

1. Ecology and food needs of the world:

One of the most famous sources in Judaism for the importance of ecology, appears in the Midrash:

> *"When the Blessed Holy One created the first human, He took him and led him round all the trees of the Garden of Eden and said to him: "Look at My works, how beautiful and praiseworthy they are! And all that I have created, it was for you that I created it. Pay attention that you do not corrupt and destroy My world: if you corrupt it, there is no one to repair it after you."*[ix]

Man receives from God for his use a perfect world but is warned to guard it. The meat industry is one of the largest environmental pollutants in the world, and the arguments in favor of cultivated meat are not limited only to the bad conditions of animal raising alone, as laboratory-grown meat can ostensibly and generally help to reduce the ecologic damage to the environment. According to the Food and Agriculture Organization of the United Nations (FAO), farms, and especially cattle, are among those responsible for global greenhouse gas emissions, which are contributing to climate change.
World food resources are limited, and animal husbandry occupies extensive agricultural land, relative to its nutritional contribution, and increases the problem of world hunger. In addition, if the price of cultivated meat is significantly lower than the price of natural meat, this will directly help the weaker population around the world. About 8 percent of fresh water is used directly or indirectly to raise animals, and it is estimated that there is a need for more than 15,000 liters of water to produce one kilogram of beef (Mekonnen and Hoekstra, 2012:401-415).[x] Despite this, the demand for meat in the world is growing, partly due to the continuous increase in the world population and the improvement in living conditions in developing countries like India and China. The FAO predicts that by 2050, meat consumption will increase by more than 70 percent compared to its level in 2010.
Studies that support the development of cultivated meat, estimate that the transition to synthetic meat - as a substitute for animal meat - will help preserve the planet. And it is estimated that cultivated meat will utilize 99 percent less land, emit 96 percent

less greenhouse gases, consume 96 percent less water and require 45 percent less energy compared to beef produced in the meat industry today (Tuomisto and Teixeira de Mattos, 2011:6117-6123). Therefore, meat grown in the laboratory can ostensibly help reduce the environmental damage caused by raising animals for food.

2. Compassion and kindness toward animals and modern food industry

Another significant consideration in favor of this technology is the prevention of the great suffering that animals raised in modern farms have. Although, in principle, human needs precede the needs of animals, it is clear that the suffering of animals should be avoided as much as possible.

There is a Talmudic debate[xi] about whether causing pain to animals is a biblical level or rabbinic level prohibition. This debate continued in the post Talmudic rabbinic literature, however most rabbinical authorities determained that it is biblical prohibition.[xii]

One of the biblical sources demonstrating the biblical origin of this prohibition commands helping a friend's donkey that is burdened by a heavy load:

> *"When you see the ass of your enemy lying under its burden and would refrain from raising it, you must nevertheless help raise it."* (Exodus. 23:5).

There are many biblical sources whose goal is to prevent the torture of animals and which show that compassion towards the animals is the way of the Torah.[xiii] According to Judaism, a Jew should cultivate the character trait of compassion and should certainly avoid cruelty. Any cruelty causing pain to animals is prohibited; sensitivity is mandated.

Unfortunately, contrary to the above, animals are not treated with compassion in modern food industries, which consider animals to be a means of production. The attitude towards them is generally exploitative, with no concern for their welfare.

3. Vegetarianism and meat diet

Another consideration that ostensibly supports the use of genetic technology to produce synthetic meat is the Sages' general support for vegetarianism. In general, it can be said that throughout the ages, many of the Sages have treated the eating of meat as a reserved permit given without encouraging it. Some called to reduce the eating of meat, and to eat it on Shabbat and holidays only or for the strengthening of the body for the purpose of the study of Torah and its observance.

When the world was created, people were not allowed to eat meat, only vegetable-based food: "*God said, "See, I give you every seed-bearing plant that is upon all the earth, and every tree that has seed-bearing fruit; they shall be yours for food."(*Genesis 1,29*).* Both Man and animals were supposed to be vegetarians.[xiv] Much later, after ten generations, following the Great Flood, once Noah and his sons exited the Ark, they were allowed to eat meat:

> "*The fear and the dread of you shall be upon all the beasts of the earth and upon all the birds of the sky—everything with which the earth is astir—and upon all the fish of the sea; they are given into your hand.".(* Genesis 9:2-3*).*

Although the divison into clean and unclean animals[xv] existed at the time of Noah, from then on they were allowed to eat all meat, with one caveat: "*You must not, however, eat flesh with its life-blood in it."(* Genesis 9:4*).*
Rabbi Josef Albo[xvi] explains that the permission to eat meat was sufficient to satisfy the man's lust (Albo 1929-1930: III, 15.). His personal opinion about eating meat is very negative:

> *"Besides the cruelty of killing animals, it is helping develop a bad character for a person to pour blood unnecessarily; additionally, eating meat will also lead to fattening and insensitivity in the soul of man".*[xvii]

Similarly, Don Isaac Abarbanel explains in his commentary, why the food God provided to the Israelites in the desert was "bread", which is the mana, and not meat:

> *"God said to Moses: Meat is not a necessary food, and its purpose is to satisfy the lust for binge eating and eating out of great lust, as well the meat makes the person cruel, and therefore the animals and the predatory birds who eat meat are cruel and evil. But the sheep and the cattle, the doves, and the pigeons, who exist from eating the grass of the field, have no cruelty or evil. and therefore the prophet promised that at the time of the future redemption," The cow and the bear shall graze, their young shall lie down together; And the lion, like the ox, shall eat straw.." (Isaiah 11,7) and explained the reason for that when said: „In all of My sacred mount- Nothing evil or vile shall be done;*
> *For the land shall be filled with devotion to the LORD As water covers the sea." (Isaiah 11,9). Therefore, the Holy One, blessed be He, did not say to Moses that He would give Israel meat, but rather bread, which is proper and necessary food for human nature. This is the meaning of the verse, " I will rain down bread for you from the sky"(Exodus 16:4)".* [xviii]

Rabbi Abraham Isaac Hahoken Kook,[xix] who was a vegetarian, refers in various places to the question of the proper treatment of animals. He brings the opinion of our Sages in the Talmud[xx] that eating meat was forbidden to Adam and that only because of the deterioration of mankind after the sin of the flood it was then permitted for man to kill animals and eat their flesh (Cohen 1961: 49). However, he is very clear about the immorality of eating meat.[xxi]
Rabbi Kook also sees the negative attitude of the Torah towards eating meat in the style in which the Torah describe the desire to eat meat: "If the place where God has chosen to establish the divine name is too far from you, you may slaughter any of the cattle or sheep that God gives you, as I have instructed you; and you may eat to your heart's content in your settlements.' (Deuteronomy 12:20). The use of the word "תאווה" in the Hebrew version (=Lust, desire, passion) in the Bible is describing materialistic inclinations.[xxii]

Rabbi Kook explains why the Torah actually didn't forbid eating meat. In his view, the moral development of mankind must be gradual. First, human beings must solve the problem of enmity and wars among them, and only then can they reach the high moral level of moral and just behavior towards animals.[xxiii] In other words, the meat-

eating permit is a sort of temporary moral concession.[xxiv]

However, already in the existing system of commandment in the Torah, there is a constant dripping of values, which will constitute the moral preparation for changing the behavior of the human race with the animals in the future.[xxv] For example, the mitzvah[xxvi] of covering the blood after slaughtering is meant to remind people that there is a moral defect that should be ashamed of taking animal life.[xxvii] Rabbi Kook believes that in the future, sacrifices will not be sacrificed from the animal in the Temple, but only from the plant (Sperber, 1992: 97-112.). And despite all the above, according to Judaism there is no practical prohibition on eating meat and therefore care must be taken to have kosher meat available to anyone who is interested.

4. Excessive intervention in creation

The technology of genetic engineering is touching a very sensitive issue. In Judaism there is a significant prohibition which instructs man to withdraw from actions that create a significant and fundamental change in the world nature. This is a ban on breeding different species of animals and a ban on assembling different trees and sowing different species in one field. Nacmanides[xxviii] in his commentary write the reason in his opinion for this prohibition:

> *"Thus one who combines two different species, thereby changes and defies the work of Creation, as if he is thinking that the Holy One, blessed be He, has not completely perfected the world and he desires to help along in the creation of the world by adding to it new kinds of creatures."*[xxix]

According to various rabbinical authorities, this is the logic behind the prohibition to practice witchcraft.[xxx]

5. Fear of dangers that may result in the far future from technological development

In the last century, there has been a real revolution in the various fields of science. Various technologies have been developed and contributed greatly to the well-being of mankind. Some of these technologies like nuclear physics bring with them heavy ethical questions. However, no country has objected to technological advancement due to unclear future concern.

The Sages have stated that special attention should be given to future concerns, however they should be clear and concrete concerns and there is no room for far-reaching concerns.[xxxi] In any case, care must be taken to ensure that progress on such issues is made carefully and gradually, which will make it possible to examine the existence of future risks. And if it does turn out that there are clear concerns then the establishment of appropriate supervisory mechanisms is required.

III. THE KOSHER STATUS OF THE SYNTHETIC MEAT

When we come to discuss the status of kosher synthetic meat, the big question which is disputed between the various rabbinical authorities[xxxii] is: should the Jewish law

consider this product as “meat”?

If the original cell is taken from meat, during the production process the original cell loses its importance, and if so, perhaps because of this the product is not meaty? Furthermore, if the assumption that the original cell is not related to the final product is indeed correct, then the question arises as to what will be the status of such a product when the original cell is taken from a non-kosher animal, such as a pig?

The question of the kosherness of synthetic meat is very challenging because of its innovative character. It deals with a situation that is difficult to find similarities to previous issues. Below we will briefly present some of the main issues that are raised in this discussion.

1. The status of stem cells

What is the status of a stem cell that is about a thousandth of a millimeter in size, and can only be seen with a microscope? There is a well-accepted halakhic decision, discussed by main rabbinical authorities such as Rabbi Moshe Feinstein[xxxiii] of the Ashkenazic[xxxiv] Jewish Community and Rabbi Ovadya Yosef[xxxv] of the Sephardic[xxxvi] Jewish Community. They ruled that there is no need to worry about the kosher status of something when the forbidden thing is indistinguishable to the human senses (like invisible insects, which are strictly prohibited) and in our case is the cell that is invisible to the naked eye.[xxxvii] Thus ostensibly such a cell, even if taken from a non-kosher animal or has not undergone kosher slaughter, should not be a problem. On the other hand, this is a very important cell that, although not visible at the moment, is the primary reason for the creation of the final product that is visible.

2. The halakhic status of the fetus or pre-fetus

Another issue is the halakhic status of the fetus or pre-fetus from which the stem cell was taken. According to Halakha, a fetus during the first forty days from the beginning of pregnancy is considered only 'water'.[xxxviii]

Although the fetus already has stem cells, and therefore, some believe that it should not be considered "meat" at all, even if the cell was taken from a kosher animal. Furthermore, according to this opinion the cultivated meat is allowed in cooking and eating with milk[xxxix], since it has no natural and real meat flavor that was in the original cell that came from the beef (Reisman, 2014:103).

3. Status of a raw material that undergoes a process that brought to a change of its identity

Another principle issue of kosher dietary laws is the status and identity of a raw material that undergoes a complex process that leads to the abolition of the first identity. The production process, even if it starts with taking a meat stem cell, it only starts from a "meat" cell but the development process is very complex from which in the end you get muscle tissue that undergoes processing to get a product worthy of eating. Ostensibly the final product is a new and different product that is no longer related to its initial identity. The classic example of this is gelatin - a stabilizer used extensively in the food industry - is a coagulated protein extracted from animal bones

and skins, soaked in salt and lime, and ground with additional chemicals into a fine powder after cleaning and drying in the sun. Because of the complex process of gelatin production that alters the original identity of the raw material, some rabbinic authorities have allowed its use even when it is extracted from non-kosher animals.[xl] On the other hand, there are other rabbinic authorities who have banned the use of gelatin extracted from non-kosher animals.[xli] In their opinion the bones were not fit to be eaten, but after the gelatin production process they became fit to be eaten, so the ban is back in place. Therefore, based on their opinion, cultivated meat originating from a cell of a non-kosher animal is also prohibited.[xlii]

In contrast, those who allowed to eat gelatin extracted from the bones of non-kosher animals will allow the kosherness of cultivated meat produced from a cell taken from a non-kosher animal and will not consider it "meat" at all.

4. Ingredients in production

Another question deals with the kosherness of the substrate and the other components that help in the growth and duplication of the cell. The most common use today is blood, and therefore it seems that this will result in a prohibition of eating the meat. However, when using a plant-based substrate and scaffolding, there is no kosher problem in this context.

CONCLUSION

We have seen that Judaism supports technological development even if it is groundbreaking to the point of interfering with nature. At the same time, such developments require scientific caution, they must be done carefully and gradually while examining the various possible risks, and if the risks of developing a particular technology are not high, then it is worth developing.

In cultivated meat, the risks are not high at the moment, so it seems appropriate to continue the development. We have also shown that as a result of this development, there may be a great benefit to humanity by increasing food reserves, preventing ecological damage to the planet and reducing damage to animals.

Regarding the kosherness of cultivated meat, we have seen that there are different opinions among the rabbinic authorities. It is important to emphasize as we have pointed out that there are different types of technologies in laboratory crops. Each development and technology requires its own discussion because there are many different details in each method that can be applied to halakhic case law.

In principle, it can be said that cultivated meat produced from a stem cell taken from a kosher animal that has been slaughtered properly - and if the other ingredients that help improve the cell and its cultivation are kosher, it seems that this meat will be kosher.

A stem cell taken from the flesh of a non-kosher animal, some rabbinic authorities consider it forbidden and some consider it permitted as in the case of gelatin.

Similarly, according to some opinions, the final product is not considered "meat" at

all in terms of kosher dietary law (especially regarding the prohibition of mixing meat and milk), due to the production and processing processes it goes through. Yet, since this is a very new development, the final kosher status of the product will depend directly on the exact technology in which the meat will be produced, and the kosherness of the substrate and other components that help in the growth and duplication of the cell.

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i. *Halakha* – 1. the legal part of Jewish religious literature; the name comes from the verb "הלך" (to go), because Jews "go" in the path of the Jewish law. 2. Individual provision from the Halakha system; More about Halakha see Dadon (2009:481).
ii. II See also: Leviticus 26:14-16; Deuteronomy 28:61.
iii. See: Babilonyan Talmud Baba Kamma 85a (Vilnius).; Babilonyan Talmud Berachot 60a (Steinsaltz).
iv. Shulchan Aruch, Yore Dea 336:1.; see also Dadon (2017).
v. midrash - interpretation; commentaries on the Torah; there are two types of m.: aggadic (homiletical) and halakhic (legal); collected in many diffrent collections. See more about *Midrash* in Dadon (2009: 503-505.
vi. Midrash Shmuel 4. See: https://www.medethics.org.il/article/rj001120a/ (28.7.22)
vii. This is why according to Judaism Artificial insemination as an example is permitted, since it is treated as healing, see Dadon (2014).
viii. See Midrash Tanchuma, Tazria, 7.
ix. Midrash Kohelet Rabbah 7:13. See: https://www.sefaria.org/Kohelet_Rabbah.7.13.1?lang=bi (28.7.22)
x. [1] For more information see Noam Liviatan article: https://davidson.weizmann.ac.il/online/sciencepanorama/%D7%9C%D7%90%D7%9B%D7%95%D7%9C-%D7%91%D7%A9%D7%A8-%D7%91%D7%9C%D7%99-%D7%9C%D7%94%D7%A8%D7%95%D7%92-%D7%97%D7%99%D7%95%D7%AA (28.7.22)
xi. [1] See: Babilonyan Talmud, Baba Metzia 32b., (Vilnius).
xii. [1] See: Steinberg (1989. I:263-269).
xiii. [1] For more about Cruelty to animals in Judaism see: Deutoronomy 22:10; 25:4; Babilonyan Talmud Baba Kamma 54b. (Vilnius); Babilonyan Talmud, Baba Metzia 89a. (Vilnius).; Babilonyan Talmud, Baba Metzia 85a. (Vilnius); Halevi (1996: 778).; See also: Dadon i Dadon, (2018: 453-474).
xiv. Babilonyan Talmud, Sanhedrin 59b (Vilnius).
xv. See: Genesis 7:2.
xvi. Albo, Rabbi Josef (1380-1444) – One of the later sefardic philosophers, who bring to a close the time of classical hebrew philosophy. Rabbi, doctor, philosopher, Albo served as a rabbi of the town of Daroca in Arragon and the town of Soria in Castille. His only book entitled Haikarim (Principles) and written in hebrew, speaks about the principles of Jewish thought and was one of the first printed texts in Hebrew (Soncino, 1485.). It was republished seventeen times, the book has seen two important rabbinic

commentaries on that book (in the 16th and 17th centuries) and a critical publication that accompanied and engish translation (Issac Husik, Philadelphia, 1929.-1930.).

xvii. ibid.; From Hebrew translated by the author.

xviii. Abarbanel, don Isaac (Hebr.: Harav Yichak A.) (Lisbon, 1437 – Venice, 1509) – Commentator, philosopher and politician, a descendant of King David, leader of Spanish Jewry. Portuguese minister of finance at the time of the King Alphonso V as a refugee from Spain. He was also the minister of finance of King Ferdinand and his wife Isabella (1487). During his life in Spain, he authored a commentary on the Book of Joshua, Judges and Samuel. For eight years he served the kingdom and made Spain wealthy and in 1492, when Jews were exiled from Spain, he was their leader. He settled in Naples, where he composed his commentary on the Kings and other biblical books. He also commented on the Mishnaic tractate Avot (The sayings of the Fathers) and a Haggadah for Pesach. He wrote philosophical books using the Rambam method and on the basis of his texts. In his Tora commentary he analyzed various social systems of his time and compared them to the social life in Israel in biblical times.

xix. Abarbanel (1862; Exodus. 16:4.) ; From Hebrew translated by the author.

xx. Kook, Abraham Isaac Hakohen (Latvia, 1865- Jerusalem, 1935) A giant of Jewish thought of the last generations; rabbi of Jerusalem and after the establishment of the Chief Rabbinate the Chief Ashkenazi Rabbi of Israel since 1921 until his death. Spiritual leader of Zionism. In 1888 named the rabbi of Zaumel, in 1895 in Bausk in Latvia; moved to Israel in 1904. As the rabbi of Jaffo he was actually the rabbi of all Jews living in Israel. Before the First World War attended a rabbinic conference in Europe and was forced to stay in Switzerland and in London until the end of the war. Returned to Israel in 1919. The founder of the Merkaz Harav Yeshiva in Jerusalem, which was headed by his son Rabbi Zvi Yehuda (1890-1983) after Rav Kook's death. Until today, that yeashiva remains a great center of Torah study and through its special teaching methods it emphasizes love for the Israeli people and land. After his death, he left a treasure trove of manuscripts on various topics ranging from Kabbalah, philosophy, Halakha, Talmud commentaries, responsas and liturgy, many of which still remain unpublished today. The most famous book of responsas is "Ezrat Kohen" (The help of the Kohen). He greatly influenced the history of new settlement of Israel. He was well-known for his love of first settlers, both believer and non-believers.

xxi. Babilonyan Talmud, Sanhedrin 59b. (Steinsaltz).

xxii. Ibid. pp. 7-8.

xxiii. See: Exodus 3:6.; Numbers. 11: 4.; Deuteronomy 12:20; 1Samuel 2:16; Psalms 106:14.; Proverbs 13:12.

xxiv. Cohen 1961:14.

xxv. ibid. pp. 18.

xxvi. ibid. pp. 23.

xxvii. *Mitzvah* – a religious obligation, a deed pleasing to God; There are 613 mitzvahs in the Torah; 365 prohibitions and 248 commandments, which a religious Jew must adhere to; one part of the mitzvahs deals with man's relationship with God, and the other part deals with man's relationship with his fellow friends. The obligation to fulfill the mitzvah applies to women older than 12 years and one day (bat mitzvah) and to men older than 13 years and one day (bar mitzvah). For more about Mitzvah see: Dadon, 2009:335.

xxviii. Cohen 1961:23-24.

xxix. *Nacmanides*- Moshe ben Nahman, rabbi, abbreviated: Ramban, also known as Nachmanides (Girona, Aragon, 1194 - Israel, 1270) - A famous rabbi of his time with great knowledge in many fields: science, philosophy, language and medicine. He was

a contemporary of Maimonides, his students include Rabbi Shlomo ben Avraham Aderet and Rabbi Aharon Halevi. He wrote a commentary on the Torah and compiled halachic books. He was one of the first to deal with Kabbalah, and his writings are also influenced by Kabbalah. When he was 73 years old, he moved to Israel, arrived in Jerusalem, where he rebuilt the Jewish settlement, because the city had been destroyed by the Tatars before that. To this day, the synagogue he founded and which bears his name still functions in the old city of Jerusalem. Due to a difficult life and the inability to earn a living, he went to nearby Ako, where he founded a yeshiva where he remained for the rest of his life.

xxx. Nacmanides (1959: Leviticus 19:19).

xxxi. See: Dadon (2021:923-932).

xxxii. See: Mishnah (1987: Pesachim 1:2; Yoma 1:1.).

xxxiii. In recent years a number of articles have been written on this subject. See: Reisman, (2014: 99–112); Spitz, (2015:193–196); Ariel, (2016: 447–454).

xxxiv. R. Moses Feinstein (1895-1985) Lithuania and U.S.A.

xxxv. Ashkenazic – initially the name for Jews of Germany and northern France, but since 16th century refers to Jews of Eastern Europe and Russia, who all share the same customs and similar prayerbooks. In the 19th and 20th centuries the Ashkenazi Jews spread to all corners of the Earth maintaining their customs. The majority of Ashkenazi Jews spoke in the language called Yiddish. The biblical word Ashkenaz אשכנז started being used as a synonym for Germany because it is written using the same but differently distributed letters as does the word Sachsen אשכנז (Hebrew script consists only of consonants).

xxxvi. R. Ovadya Yosef (1920-2013) Bagdad- Israel.

xxxvii. Sephardic – a branch of Jews, descendants of Jews exiled from Spain and Portugal in the end of the 15th century, north African Jews, Jews from the Arabian Peninsula as well as from the Mediterranean to Georgia and Bukhara; they have a different prayerbook, customs and melodies than Ashkenazi Jews.

xxxviii. See: Feinstein (1961: Yore Dea II:146).; Yosef (2020: VI: 47).

xxxix. See: Babilonyan Talmud Yevamot 69b (Vilnius); Babilonyan Talmud Nida 30a (Vilnius); Maimonides (1974: hilchot Isure Bia 10:1).

xl. For the prohibition on mixing meat and milk see: Dadon, 2009:310.

xli. Yosef (2015: VIII, Jore Dea 11.)

xlii. Feinstein (1961: Yore Dea II:27).

xliii. See: Ariel, (2016: 447–454).

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HALAL PRODUCT MARKETS

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Abstract
Halal products (halal food) are more present in the world, while the halal certificate is a ticket to the world market of halal food products. Halal market participants could never make a big profit because of the philosophy of nutrition itself, which is not based on material gain, but on meeting religious requirements. Slightly higher product prices are justified by additional funds invested in marketing in order for the product to be recognized in the global market as halal. The subject of research is the halal food market, as well as the financial market, then the markets of fashion, media, pharmacy and cosmetics. The main goal of the research is to study the size and importance of individual halal markets. Because, world leaders in food production, but also smaller producers and companies with great potential for further growth and development are competing to appear on the halal market.

Keywords: halal certificate, market, brand, entrepreneurship
JEL codes: P23

INTRODUCTION

From the standpoint of Islam as a religion, there is a difference between halal and haram, ie permitted food and non-food products and services and illicit food and non-food products and services. Halal products can even be considered differentiated because not all market participants produce halal products. In this case, the competitive advantage of halal products over non-halal products is the impossibility of substituting halal products with non-halal products, thus reducing the risk of imitations as well as innovations in production using new additives due to strict religious regulations. From the Qur'an come three basic concepts that define the complete style of human life: halal, as something that is allowed; haram as something that is strictly forbidden, and meshbuh as something that is suspicious. The principles of halal, haram and mesbuh can be applied to all categories of products and services. Regardless of the category of products or services, all have in common the fact that halal is acceptable for people of all ages and regardless of their religious affiliation, and that halal certificate guarantees a healthy product with additional quality control controls (Fornažar Agić, 2018).

THE VALUE OF HALAL DEVELOPMENT AS A BRAND

Having a halal certificate or using halal as a tool to gain a comparative advantage can be considered a factor that can help expand business, create new markets and attract more consumers / customers. He also managed to "increase the value of various brands, alleviate restrictions on barriers to entry in certain markets and stabilize fluctuating markets" (Edbiz Consulting Group). Traditionally according to the Qur'an everything that is not halal is haram, so the precondition of halal for some product, service or process is mostly obvious. Meshbah (uncertain) situations require further research in the form of laboratory tests of ingredients, the environment and the employees involved, so conclusions as to whether meshbah is halam or haram are rare, or never, are not drawn from marketing. However, with the saturation of the market with various products and services, from various sources, it is inevitable that halal branding is becoming increasingly important. Certificates issued by credible agencies and institutions, as well as the brands themselves, enable differentiation and informed decision-making on purchases.

According to some authors, apart from the fact that most people are uncertain whether Islamic marketing can be considered a separate scientific discipline at all, it remains controversial that it can be considered a halal brand. That is, questions are raised as to whether it depends on:

-communicating positive statements of the organization through the brand;
-the very nature of the product, process or service;
-countries of origin;
-destination of products / services branded halal certified;
-belief of entrepreneurs;
-halal certificate of ingredients;
-market share of Muslim and Islam friendly;
-participation of Muslim employees;
-implementation of positive consumer policies towards Muslims;
-use of Islamic or Islam-inspired symbols and messages.

For some scientists, there are no dilemmas, and they consider those products / services that meet three conditions to be the original Islamic brand:

1. comply with Sharia law,
2. originate from Islamic countries,
3. The target market is Muslims.

However, they distinguish between the terms presumed halal brand, which means products / services originating from Islamic countries whose target market is Muslim, but not explicitly compliant with Sharia law, and imported Islamic brand, which includes "Islamized" and halal certified products / services originating from non-Muslim countries. , whose Muslims are the target market. It should be emphasized that products marked with the original Islamic brand or imported Islamic brand bear the halal quality logo as a symbol of compliance with Sharia law, and are approved by accredited certification agencies.

According to Hodžić (2010), halal products can be considered differentiated because not all participants in the market produce halal products. In this case, the competitive advantages of halal products over non-halal products are the impossibility of

substituting halal products for non-halal products and the risk of imitations and innovations in production using new additives is reduced due to strict religious regulations. Also, according to Hodžić (2010), halal market participants could never make large monopoly profits due to the very philosophy of nutrition, which is not based on material gain but on meeting religious requirements. Slightly higher product prices are justified by additional funds invested in marketing in order for the product to be recognized in the global market as halal.

Halal-certified products are subject to control, whether in production facilities or in certain institutes, where the analysis of already certified products for pork, fat, protein, alcohol and GM foods is performed.

Halal tourism in perspective represents much more than a classic offer. In wellness tourism, it is necessary to use special cosmetics that meet the requirements of the halal certificate. Health tourism is slowly growing

opens to the eastern market, since the ratio of price and quality of health services in the countries of the eastern market is competitive compared to other developed countries, more and more guests come to these regions for treatments or various aesthetic procedures and corrections. In halal tourism, it is also important to take care of special nutrition, as well as the possibility of separating patients according to gender. For congress halal tourism, tse estimates that it will grow rapidly in the coming years.

HALAL MARKETS

According to estimates, more than 1.6 billion Muslims live in the world today, which is about 24% of the world's population. Also, according to the current trend, Muslims will make up more than 26% of the world's population, which is planned to number more than 8 billion kudis according to estimates by 2030. From the economic aspect, it is estimated that the value of the Muslim market will amount to more than 2 trillion dollars. According to economic forecasts of the growth trend, this market is the fastest growing segment at the level of the world economy. According to generally accepted estimates, it is believed that the market for halal food products will account for more than 12% of the total world market or close to 600 billion US dollars.

Table 1. Overview of the Muslim population by country

The largest Muslim population	**The largest Muslim% of the total population**	**The greatest purchasing power of the Muslim population**
Indonesia	Bahrain	Saudi Arabia
Pakistan	Kuwait	Turkey
India	Saudi Arabia	Iran
Bangladesh	Algeria	Malaysia
Turkey	Iran	Qatar
Egypt	Oman	Russia
Iran	Turkey	France

Source:State of the global economy, https://haladinar.io/hdn/doc/report2018.

The halal market is viewed through various aspects, the most important of which are: the halal food market, the halal financial sector, halal tourism and travel, halal fashion, and the pharmaceutical industry and cosmetics. Through these sectors, a more detailed overview of the countries of the world in the halal market was obtained.

HALAL FOOD MARKET

No matter how advanced the halal market is, there always seems to be room for further growth and additional opportunities. In modern conditions there is an increase in online ordering and delivery of halal food, the number of companies dealing with online sales of halal food has increased. HalalEat in the UK, Singapore-based Halalonclick and Russia's HalalEda are among the leading companies in the field of halal food.

Ramadan Energy Bar is a leading innovative company that has high potential in other areas as well, such as the baby food sector. Due to all of the above, today it is quite certain that food marked as halal will record a constant growth trend in the coming decades.Muslims spend $ 1.3 trillion on food and drink in 2017 and are projected to reach $ 1.9 trillion by 2023.

In 2017, Muslim countries had halal food imports worth $ 191 billion and exported $ 124 billion. Muslim countries prefer vegetarian products the most, importing $ 92 billion in 2017, importing $ 63 billion worth of animals and animal products, and importing $ 35 billion worth of food needed for manufacturing and the processing industry.

The following table shows the top 4 countries in the food halal market. The table shows that Indonesia is the leader in the food halal market. The success is the result of control of the halal food industry, which has been fueled by strong publicity. For example, Pakistan has been among the leading countries for many years thanks to relatively low halal food costs, positive legal regulations and the fast-growing certification segment

Table 2. National consumption of halal food in the halal market

Nº	Country	Amount (billion $)
1.	Indonezija	170
2.	Turska	127
3.	Pakistan	118
4.	Egipat	86

Source:State of the global economy, https://haladinar.io/hdn/doc/report2018.

Table 3. Opportunities and challenges in the halal food market

Opportunities	Potential
Halal meat snack	It has a large capacity for halal food brands of products that can continuously increase the offer by increasing and expanding their potential.

Baby food **Halal fodder**	There is a chance for completely new and the development of already existing companies that have the potential to expand their production by introducing new products into their production program, such as, for example. halal baby food. There is also the possibility that the food that is fed to the animal fund is also certified, as well as the possibility that the entire chain of food products, from raw material suppliers to finished products, is also certified.
Challenges	**Potential**
Lack of global harmonization	There is a pronounced problem because there is no generally accepted standard at the highest level, which increases and complicates the certification system itself. Today there are about 300 recognized certifiers, but control by accreditation bodies is still unsatisfactory.
Limited supervision	Global food security had the wrong regulatory structure, which it solved by creating a common regulatory framework. Halal food has taken important steps by setting up accreditation forums in the UAE and Malaysia.
Regulations to make halal a world leading standard and Upgrade halal certification	1. Creating a common framework, streamlining existing standards 2. Create a globally accepted regulatory structure; format the current halal 3. Creating commitment and awareness

Source:State of the global economy, https://haladinar.io/hdn/doc/report2018. islamicbankers.files.wordpress.com

HALAL FINANCIAL SECTOR MARKET

Global Islamic finance assets are estimated to be over $2 trillion, making Islamic finance increasingly important, especially in major financial centers such as Malaysia and London. The financial sector highlights its foundations in Sharia law, and Islamic principles of financial business find new customers, both Muslims and non-Muslims, who prefer ethical banking and financing projects of food industry companies.
Traditional Islamic financial centers are growing, where the UK stands out as the UK has the largest financial industry operating under Islamic rules.. Competition is also emerging: the financial industry of Indonesia and Pakistan, Australia and Uganda, which want to strengthen the sector (islamicbankers.files.wordpress.com). According to the latest reports, the Islamic finance industry is now estimated to be worth around $2.5 trillion and is projected to grow by close to 8% to reach close to $4 trillion by 2023.

Islamic finance consists of Islamic banks, Takaful Insurance (a type of donation in case of loss of assets), Sukuk assets (name for financial certificates) and other financial institutions. The most significant assets are Islamic banking and amount to 1.452 billion USD. The following table shows the top 10 halal financial sector markets. Iran has been leading the halal financial sector rankings for many years while Malaysia is the center for Islamic finance. there is a justification for this in the property potential and a large number of financial funds and institutions and the strongest regulatory framework. The UAE ranks fourth on the list because it has a low asset base but is making great efforts to improve awareness, media campaigns to secure its status as a world center. All other countries on the list of the top 10 halal financial sector markets have managed to maintain these positions despite revenues from the sale of natural gas and oil have been decreasing recently.

Table 4. Top 10 countries in the halal financial sector market

	Country	Amount ($ billion)
1.	Iran	580
2.	Saudi Arabia	510
3.	Malaysia	490
4.	UAE	220
5.	Qatar	130
6.	Kuwait	110
7.	Bahrain	85
8.	Indonesia	82
9.	Turkey	54
10.	Bangladesh	34

Source:State of the global economy, https://haladinar.io/hdn/doc/report2018.

Table 5. Halal financial sector market opportunities and potentials

Opportunities	Potential
Sharia pensions	The Malaysian pension fund announced an Islamic savings plan of close to 30 billion US dollars, which is the largest pension in the world. Among the countries of the Islamic world, Indonesia has allowed the development of Islamic pension funds. of sharia sharia pensions and is gaining approval in the UAE. Islamic banks should focus on low-income consumers to provide them with retail offers and high-income consumers to offer them sophisticated banking offers. Financing of poor societies can be provided on the basis of partnership agreements, which can improve the protection of sufficient food and agricultural products.
Challenges	**Potential**
Infrastructure	Islamic finance is characterized by massiveness and volume, but it lacks a workforce that has the capacity to manage finances. According to modern estimates, the Islamic financial industry is more than 2.4 trillion US dollars as an

	industry, but there is still a problem of skilled labor. In this, Saudi Arabia leads the way, where Islamic financial assets are estimated at around 510 billion dollars and are now larger than Malaysia.
Lack of talent	According to a survey conducted by the Malaysian International Center in 2017, the three biggest skills deficiencies in Islamic finance are expertise and innovation and investment knowledge financing. Such an example is the expertise of human capital in Islamic finance in Brunei hampered their development to become a financial hub for Islamic banking and finance. However, education in Islamic finance is being improved through the Islamic Institute for Research and Training, the Islamic Development Bank.
Vocational education development plan	1. connection with faculties that offer knowledge in Islamic finance 2. Systematization of professional qualifications management of Islamic finance 3. Involvement of industries and experts in training design

Source:State of the global economy: islamicbankers.files.wordpress.com; "Enhancing Halal Sustainability", Springer Science and Business Media LLC, 2021

HALAL TRAVEL MARKET

"Travel the earth and watch as He begins creation"
(29:20, Quran)

Muslims want to vacation in an environment that respects their religious beliefs and meets their religious needs. These wants and needs range from the provision of food certified as halal in restaurants to a rich offer in terms of accommodation that includes a special prayer room or separate rooms, and especially family content on beaches and pools according to Islamic understandings, Islamic themed parties. The vision of Saudi Arabia and Oman for 2030 and 2040 is that they they support that tourism becomes the main driving force behind the growth and development of the economy. Saudi Arabia is also trying to promote itself in terms of tourism not only for pilgrimage Muslims by extending visitors' stays for other religious, historical and cultural sites. She intends to invest billions of dollars in entertainment infrastructure over the next decade or so. Muslims are spending $ 177 billion on travel in 2017, and is projected to rise to $ 274 billion by 2023.

The following table shows how much each country spends on halal travel. In 2017. Saudi Arabia leads in spending Muslims on halal travel. The UAE is lagging behind Malaysia this year, largely due to rising awareness, while maintaining a high level of incoming Muslim travel. It has become a country that is attractive for halal travel. Malaysia retained the seventh place and below it is ranked Turkey, which is in the ninth place, although the number of Muslim trips has significantly improved the rating of the halal system, so Turkey has a dobafr tourist rating as a tourist destination and a link between East and West.

Table 6. National halal travel consumption

	Country	Amount ($ billion)
1.	Saudi Arabia	271
2.	UAE	16
3.	Qatar	13
4.	Kuwait	10
5.	Indonesia	10
6.	Iran	8
7.	Malaysia	7

Source:State of the global economy, "Enhancing Halal Sustainability", Springer Science and Business Media LLC, 2021

Table 7. There are great opportunities in the halal tourism market within the range of products and services.

Opportunities	Potential
Islamic focused resorts with full board **Themed Islamic travel packages** **Islamic focused hotel applications** **Home and meal sharing** **Online platforms for tourist tours and activities** **Financial services for family vacations**	Travel agencies can justifiably specialize narrowly only in certain tourist offers or focus carefully on certain market segments, for example they can offer themed tourism such as cruises and adventures or sports and congress tourism. Hotels can also meet guests of the Islamic religion by respecting discretion or providing information about places for performing religious rites and prayers that can be in the hotels themselves or in the nearest religious institutions, and in the hotel itself can be offer food that is prepared especially for Islamic guests. It is possible to offer applications for accommodation of tourists in homes that are adapted to meet the needs of guests of the Islamic faith.
Challenges	Potential
Muslim investors are reluctant to invest in halal travel brands	In 2017, the travel costs of Muslim tourists are close to 180 billion US dollars. At the same time, investors still invest poorly in marketing that would be adapted to Muslim tourists and halal travel. And in this area, in all probability, things must change quickly. Numerous travel success stories point to potential efforts ahead, a flight booking application (Hopper), a cruise booking website (Dreamlines), HalalBooking, etc. have been designed.

Addressing the challenge of including ecosystems in entrepreneurship	The power of group funding 2. Report to incubators 3. Successful completion of the story

Source:https://haladinar.io/hdn/doc/report2018.;"Enhancing Halal Sustainability", Springer Science and Business Media LLC, 2021

MARKET HALAL FASHION

In the world of fashion, more and more attention is being paid to Muslim style. At the same time, it is not only aimed at the rich population or creations for the biggest Muslim religious holiday or only for the hijab. Muslim fashion is now much more attuned to broad market segments where it has greater growth potential. It should be mentioned that models in Muslim clothes, who advertise the hijab, are increasingly present at fashion shows. It should be mentioned that the Dolce & Gabbana fashion agency launched its first hijab and abaya collection for the Middle East market back in 2016; Burberry launched the Ramadan collection, and Uniqlo another fashion collection; H&M released a collection called LTD.

The increasing presence of e-commerce and online retailers have helped to make the Muslim fashion model popular, and hijab-wearing models have appeared on the covers of popular specialty magazines such as Cosmopolitan and Vogue. In addition, a shopping center specialized in hijab was opened in Turkey (Istanbul). in particular, it should be noted that fashion shows are significant because they help to counter negative perceptions regarding the Islamic style of dress, in addition to having tremendous potential for growth.

Muslims around the world are increasingly placing importance on fashion, with clothing spending in the Muslim world in 2017 exceeding $270 billion and projected to grow by 5% (more than $360 billion in 2023). In the following table, 7 countries on the halal fashion market are systematized. As it can be concluded, and as it is widely known, Turkey is the leader in the halal fashion market. The main reason is that Turkey is also the largest exporter of fashion items to other countries with a Muslim lifestyle and fashion. The UAE takes the second place according to this criterion, and it is characterized by the specialized Modanisa platform for online shopping.

Table 8. National consumption in the halal fashion market

	Country	Amount (million $)
1.	Turkey	28
2.	UAE	22
3.	Indonesia	20
4.	Nigeria	18
5.	Saudi Arabia	17
6.	Russia	13
7.	Pakistan	12

Source: State of global economy,"Enhancing Halal Sustainability", Springer Science and Business Media LLC, 2021

Despite the growing rivalry in the modest fashion industry, but several segments of high potential remain almost unnoticed in the offer of ready-made products. Large companies entering the halal fashion market modestly and slowly are raising concerns about the growing disconnection from end consumers. The following table shows the opportunities and challenges facing the halal fashion market.

Table 9. Overview of opportunities and potential in the halal fashion market

Opportunities	Potential
Functional fashion **Sustainable fashion** **Business incubators** **Alternative shopping platforms**	Fashion products that represent a combination of high fashion and functionality are in high demand. The Ninja Echo hijab and Veil's hijab are examples of such efforts in the world of clothing and fashion innovation. Now it is an increasingly accepted fashion, it has a global trend tendency, which is based on sustainability and moral principles. In this sense, there is a favorable chance for the creation and development of brands that are ethically accepted and at the same time made according to the principles of sustainability. This creates a chance for the development of a business incubator in the world of fashion..
Challenges	Potential
The consumer as the ultimate loser	The fashion industry for Muslim markets is growing rapidly in parallel with the increase in the number of consumers. In this sense, established fashion companies are quickly adjusting their offer in order to take advantage of the increase in market demand.
Financing independent Muslim brands	There is also an opportunity for the development of completely new Muslim companies that create new fashion brands. multinational companies are launching commoditation: 1. Independent brands have demonstrated a cunning strategy of customer engagement by encouraging the growth of leading independent brands 2. Market competition in the fashion segment and the fashion industry is strong, with the largest multinational companies being much better capitalized
Addressing fashion market challenges	1. Basic research 2. Creating suitable products 3. Availability in Muslim markets

Source: https://ceif.iba.edu.pk/, islamicbankers.files.wordpress.com

HALAL MEDIA MARKET

In the modern world, everyone can equally access media content that is marked as halal content: both Muslims and non-Muslims., on smartphones, movie screens or magazines. In terms of linguistic and cultural content, Muslim consumers are increasingly demanding today. This is best reflected in the monitoring of programs in the Arabic language, which is particularly prominent in the Middle East and North Africa, and this trend recorded a 40% growth in just 4 years (2011-2014).The lifting of the ban on cinema in Saudi Arabia brings Islamic content to a large scale. canvas. Turkish film production has become a true entertainment industry and has become increasingly popular over the past decades, the content has been translated into many world languages and we can say that it is side by side with Hollywood.
The development of the halal media market is driven by the fact that 54% of Muslims will be under 30 years old by 2030, which represents great opportunities for media producers. Muslims spent $209 billion on media in 2017, and that amount is projected to reach $288 billion in 2023.
The UAE is experiencing a rapid growth of cinemas, with huge investment projects in film and cinema infrastructure (Dubai Internet City - project of 1.2 billion US dollars). Singapore is the second largest country according to this indicator, although its share is stagnating. In third place according to this indicator is Bahrain - the GDP is quite high and records a high growth rate.

Table 10. National consumption of halal media in the halal market

	Country	Amount (in billion $)
1.	UAE	137
2.	Singapore	75
3.	Bahrain	58
4.	Lebanon	58
5.	UK	53

Source: State of global economy,"Enhancing Halal Sustainability", Springer Science and Business Media LLC, 2021

However, the main conclusion is that there is not enough investor interest in halal media, which limits new halal media. The challenges and opportunities facing the halal media market are shown in the table.

Table 11. Overview of opportunities and potentials in the halal media sector

Opportunities	Potential
Educational content for children	Great capacity to represent Islamic companies in children's programs, which spread Islamic values.
Competitions with an Islamic theme	Great interest in introducing quizzes and competitions into program formats in halal media and recreational channels, primarily to attract younger viewers.

Social video games **Sharia advertising**	Great opportunities for existing and new app developers to develop games based on Islamic values. Advertising agencies have a huge media space for online advertising, taking care of Islamic traditional values, Marketing will certainly contribute to the growth of the economy in Islamic countries.
Challenges	Potential
Halal media are fighting to secure funding	According to available data, Muslims spend about 210 billion dollars on advertising and media, but despite the great potential to create more businesses that complement Islamic education, it is still insufficient on a global scale.

Source: ceif.iba.edu.pk

HALAL PHARMACEUTICAL SECTOR MARKET

A responsible approach to health and health care is the foundation of Islamic teaching, which is why Muslims want a halal approach in both preventive and recreational medicine. However, still health challenges in the Muslim world (such as vaccine refusal because of halal status) However, as the halal pharmaceutical ecosystem has progressed over the past year marked by the pandemic, changes have also become visible at one end of the prevention spectrum. The range of vitamins and dietary supplements with halal certification has also increased on the pharmaceutical market, which has contributed to increasing consumer confidence.

This development can be linked to the new concept of halalopathy, which is an Islamic version of homeopathy. Namely, it is about connecting halalopathy with religion and modern medical science. The main sterile encirclement of science, in order to make the recovery of patients more successful and in accordance with their religious beliefs. suitable not only for Muslims around the world, but also for the total human population, which means that all countries and peoples will support them, so that halal pharmacology has an assured development chance in the future.

According to data for 2017, Muslim spending on medicines and other pharmaceutical products amounted to 87 billion dollars, and in 2023 this spending will increase many times and will amount to more than 130 billion dollars.

The top 5 countries in the halal pharmaceutical products market are shown in the following table. Turkey ranks first in the sector thanks to high exports of pharmaceutical products to Muslim countries. Saudi Arabia ranks second because they are guided by knowledge and management results, which was obvious, given the existing knowledge and experience and number of certificates, however their exports to Muslim countries are very low.

Table 12. National consumption of halal pharmaceutical products

	Country	**Amount (in millions of $)**
1.	Turkey	10,3

2.	Saudi Arabia	7,5
3.	USA	6,8
4.	Indonesia	5,2
5.	Algeria	4

Source: State of global economy,"Enhancing Halal Sustainability", Springer Science and Business Media LLC, 2021

Table 13. The lack of global certification harmonization increases costs and can destroy the value of a halal certificate.

Opportunities	Potential
Halal gelatin	Significant opportunity for the development of wholesale halal gelatin manufacturers, providing the constant supply needed for halal pharmaceuticals to be produced in bulk
Retail consumer	High willingness to create products on demand and with delivery service by providing halal cosmetic products
Challenges	Potential
Possibility of big profits	The ever-present rejection of vaccines is now a general phenomenon and not just a phenomenon in most Muslim countries, but it is a real potential danger of an epidemic. -It is mostly due to the identified gelatin from impure animals (pigs) in vaccines, and only two large companies produce vaccines without animal components - In certain Muslim countries, such as Malaysia, there has been a significant increase in vaccination refusals due to suspicions of halal compliance - According to estimates, as of 2017, as many as 20 million children throughout the Muslim world have not been vaccinated and the number is constantly increasing.
Pharmaceutical Standards Plan	If vaccines without animal components were more widely available, then they could be available and accepted by the Muslim population, making the sector worth more than $50 billion in monetary terms. The biggest problem is little government support and qualified halal certifiers. Muslim countries have and are seeking to expand vaccine companies.

Source: islamicbankers.files.wordpress.com

CONCLUSION

Long-term investment in halal production and obtaining a halal certificate is a safe way of exporting that has proven to be a successful strategy for sustainability and getting out of financial problems. A more important branch in the countries of the Southeastern Balkans is tourism, and the establishment of halal certificates in catering facilities is of great importance for tourists of the Muslim faith.

The halal market is most represented in Muslim countries, ie in Malaysia, which leads in all indicators, UAE, Egypt, Iraq, Iran and others, but with the growth of Muslims, the halal market is slowly expanding around the world.
Halal media is a great display of how the halal market is. Turkey has developed a Muslim-oriented media industry that stands alongside Hollywood.
Islamic financial centers are located in London, Thornt and these are countries that are struggling to become part of the halal market, realizing the value of Islamic finance.
The halal market is projected to reach a value of 1 trillion in the USA in 2030, where numerous spaces for other companies from all over the world can be seen. Huge space for action can be seen in the halal fashion market, where other companies, if they enter the market now, can generate large revenues with their production of modest fashion.
The halal cosmetics market provides the most room for action because so far no company produces cosmetics only for Muslims, but 2030 is considered a huge shift in this area.
Finally, the estimates of the Muslim economic sector are based on potential opportunities and are focused on their core audience, which is Muslim consumers worldwide.

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SUSTAINABLE HALAL FOOD PRODUCTION - LOCUSTA MIGRATORIA AS UNUSED POTENTIAL

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Abstract
Growing world population, limited agricultural resources for food production and global pollution represent an imperative to find an alternative to conventional food production (primarily meat). In order to achieve this goal, it is necessary to establish a sustainable diet with a reduction in meat consumption and / or the use of alternative sources of protein. Locusta migratoria (locusts) are a species believed to be one of the oldest living things in the world. In some Islamic countries, they are used as food (e.g. Indonesia and Malaysia) and have untapped potential in Western countries. Grasshoppers represent a long-term sustainable solution due to significantly lower prices of cultivation and production, but also a much smaller impact on the environment (primarily greenhouse gas emissions and waste generation - zero waste). In addition to the positive impact on the environment, their nutritional values make them an attractive alternative (high content of protein, unsaturated fatty acids and minerals).
The EU has recognized the potential for commercialization of alternative protein sources by approving Locusta migratoria as a novel food, safe for human consumption. Given the skepticism of Western consumers, the approval by European Member States is a turning point as it guarantees that locusts are a safe source of food for humans and that all legal provisions are in place to ensure quality and safety.

Keywords: Locusta migratoria, sustainable production, new food, halal, food safety
JEL codes: L66

INTRODUCTION

Social and demographic changes brought by technological progress and the progress of civilization, as well as the significant decrease in the availability of arable land with the simultaneous growth of demand from consumers, represent a challenge for today's industry and food production, giving an imperative to further progress and development of food production, finding alternative and sustainable ways of production [1]. Also, the COVID-19 pandemic and the currently unstable geopolitical and energy situation have a significant impact on social and economic development and ensuring the stability of food production and distribution [2]. Great challenges are also represented by the predicted increase in the total human population - up to 9.7 billion in 2050 while at the same time the demand for food is expected to grow by 70%, especially in terms of meat and products of animal origin [3].

Study of Žuk - Gołaszewska et. al. state: "Numerous studies have identified significant threats to the stability of the global food chain, including the reduction of food protein production and climate change as early as 1975, Meyer-Rochow proposed that insect farming could offer an alternative solution to the global protein deficit" [2].

The presentation of insects in the modern human diet as a potent source of nutrients could have a positive impact on reducing the protein gap. According to Žuk - Gołaszewska et al. "Entomophagy is a new component of the food production system in the European Union. Edible insects are recently classified as farm animals (livestock). Previously, bees were the only insects classified as livestock. Edible insects are considered a new food, and their nutritional potential could be used in the production of food for livestock and domestic animals and in human nutrition" [2].

L. Migratoria represent an available and interesting potential due to its high nutritional value, more environmentally friendly production process and production costs that are lower compared to conventional production [2].

In addition to current risks that require changes in the way food is produced, market needs and business opportunities should also be taken into account. Islam has become the fastest growing religion in the world and the halal food market is one of the largest consumer markets in the world as reported by the Stated of The Global Islamic Economy Report in Thomson Reuters (2014). All Muslims want to ensure that their food is halal. According to Islamic literature, the Prophet ate locusts. Also, consumers are generally interested in consuming low-calorie and healthy food [3].

The aim of this paper is to provide an overview of recent scientific literature and legislation for assessing the potential of sustainable grasshopper production.

NUTRITIONAL AND ENVIRONMENTAL ASPECTS OF GRASSHOPPER BREEDING

To increase livestock production, additional arable land must be provided for cultivation, which can lead to deforestation and the long-term sustainability of such a method of food production is questionable. Therefore, the possibilities of bridging

current and future food production and consumption represent the exploitation of new, unconventional sources of food. According to the research of Shrivastava et al. "The cultivation of grasshoppers and other edible insects requires significantly less food, land and water compared to livestock production, which is known to have a significant impact on the environment. In contrast, greenhouse gas emissions are minimal from grasshopper production. In general, edible insects represent a significant biological resource rich in proteins, amino acids, fats, carbohydrates, various vitamins and trace elements" [3].

Recently, the interest in entomophagy has increased and some food companies are getting creative with insect-based food production. Although grasshoppers are consumed in Arabia and Africa, less known is that they are actually widespread around the world (4). Popular grasshopper foods include fried, baked, or boiled meals. Lately, grasshoppers are in focus because they have interesting organoleptic properties, they are rich in nutritional properties and their production shows promising results [4, 5].

According to Clarkson: "The content of locusts is comparable to traditional meat sources, indicating potential as a meat or protein alternative for a growing population. There are currently only a few commercial insect-based products sold on the Western market, and they include ground insect flour, which is sold on its own or as an ingredient in various bars, chips, cookies or pasta" [6].

Clarkson also states that: "Locusts are less popular and so far very few products use extracted insect protein as a feed or feed ingredient. Even with the promising potential of grasshoppers as an alternative food source, consumers in Western countries must first accept the idea of consuming insects. The enculturation of viewing animal products as a source of protein and fat and viewing insects as pests that people try to avoid, has caused the avoidance of new insect products, also known as neophobia (fear of new foods). In order to successfully present locust products, it is necessary to work on a better understanding and research of the properties of locust proteins and the development of products based on them" [6].

Positive aspects of grasshopper breeding also refer to the fact that grasshoppers have a short life cycle in which, depending on the breeding, maturity can be reached in a maximum of eight weeks. Study of Mariod et al. shows that "they can also increase their numbers 10 to 16 times between each generation, illustrating the prospects for rapid and efficient domestic breeding" [4]. Required land for cultivation is minimal because they can be grown vertically. According to Van Huis et al.: "They show high feed conversion efficiency and resource requirements for insect farming are lower compared to other traditional livestock farming such as beef" [5].

TECHNOLOGICAL ASPECTS AND REQUIREMENTS FOR FOOD QUALITY AND SAFETY

Since the use of wild locusts as a food source is forbidden in western countries, large-scale mass production (farming) of edible insects is considered a viable solution. According to Henchion et al."Cultivated insects need to meet food safety requirements, which presents significant technological, social and economic

challenges. This new protein source requires the development of new solutions regarding the optimization of production costs, food safety and consumer acceptance"[1]. Gołaszewska et al. state: "The production of edible insects is also limited by legal regulations and social factors. Knowledge of edible insect production technologies is scarce, and producers have limited experience in the distribution and sale of edible insects in Europe" [2].

Locusts represent an optimal type of insect for food production, the cultivation of which does not require highly sophisticated equipment. They feed on a wide range of materials, show resistance to changes in breeding microclimate and great possibilities for use as food and feed. The very fact that they are very available throughout the year, that cultivation is relatively simple and that the possibilities of processing grasshoppers into different forms of food are great can represent decisive parameters for choosing insect breeding [1].

In the EU, there are a number of regulations that regulate the production of food of animal origin, animal feed and animal by-products. Among the most important are Commission Regulation (EC) no. 1069/2009, (EC) no. 767/2009, (EC) no. 999/2001, (EC) no. 853/2004 and (EC) no. 1137/2014.

According to the research of Gołaszewska et al.: "These legal acts represent the basic principles of safety in the production of animal based food and feed and standards in the production of edible insects for human and animal consumption. Also, legal regulation is a key prerequisite for the development of insect farming and effective marketing of insect-based food. Sustainable insect farming requires dedicated infrastructure and resources, including buildings, equipment and personnel. Insect production should be effectively managed to maximize yields and profits to obtain products that meet food safety requirements. Safe production of locust-based food requires the implementation of dedicated management systems, including good husbandry practices, good hygiene practices and HACCP" [2].

On the basis of EFSA opinion of October 8, 2015 (17), which concluded that if insects are fed with substrate that does not originate from ruminants or humans, and the risk itself is equal or lower that the risk of currently approved animal protein sources, amendment of Commission Regulation (EU) no. 2017/893 was adopted, which recognized insects as novel food (18). Products classified as new food are easier to register and it is additionally possible to put parts of locusts and products based on locusts (e.g. flour) on the market in addition to whole locusts. The regulatory framework covers the entire production chain since, as with conventional production, locust farming needs to be monitored to ensure the safety and quality of the finished product. The cultivation itself is under the supervision of competent authorities in order to ensure a safe product for consumers [2].

It is very hard to exactly determine the global consumption of [11]. Currently, more than 2000 species of insects are consumed in more than 80 countries with grasshoppers accounting for 13% of global consumption [2]. In 2019, 500 tons of insect food were produced in the EU. Research of Gołaszewska et al. shows that "According to some estimates, around 1 million tons of edible insects will be produced by 2030 and processed into 260,000 tons of insect-based food. These products will reach 390 million consumers. The market value of edible insects is expected to reach around 2 billion euros by 2030" [2]. The leading country in the cultivation of

grasshoppers in the EU is the Netherlands, where the average selling price of 35 g of grasshoppers is 9.99 euros [2].

SUSTAINABLE PRODUCTION AND ENVIRONMENTAL ASPECTS

Greenhouse gas emissions represent a major global problem. Global warming comes from industrialization, agriculture, and similar activities such as crop fertilizer production, farm energy costs, feed transportation, animal waste processing, ruminant intestinal fermentation, and domestic animal waste. On the other hand, the cultivation of Locusts offers great potential for environmental protection due to the high conversion of food, the possibility of cultivation on waste products, the use of less water during the cultivation cycle and the like [3].

Also, since grasshoppers are cold-blooded animals, they need minimal amounts of food to produce energy and heat. Studies have shown that the production of 1 kg of poultry meat requires at least 2.5 kg of feed, the production of 1 kg of pork requires 5 kg of feed, and the production of 1 kg of beef requires 10 kg of feed. On the other hand, grasshoppers need only 1.7 kg of food to produce 1 kg. In addition, utilization of protein and other nutrients in chicken is 55%, and in beef 40%, while grasshoppers have utilization of 80% [3].

The continued depletion of natural resources leads to further adverse effects on the environment. In this context, insect breeding stands out as an ecologically acceptable alternative. Low demand on agricultural land compared to conventional livestock production and high utilization rate of waste products are additional reasons why locust farming has such great potential for sustainability [12, 13].

As with conventional animal cultivation, by-products are created in the production of insects. In addition to mortality, grasshopper excrement is produced, which has great potential as a fertilizer (e.g. organic fertilizer, compost material or soil improver). The NPK profile of excrement shows that it contains certain beneficial bacteria that promote plant growth, thereby improving plant health and facilitating nutrient absorption. Locust excrement is used as fertilizer in nurseries and viticulture and represents a valuable alternative to today's conventional fertilizing products, which has an additional positive effect on the use of mineral fertilizers.

Also, the use of the by-products of locust farming is in line with the principles of the circular economy since the reintroduction of valuable substances into the production chain is an alternative to linear models where waste is in most cases disposed of by burning or dumping in landfills [14].

WESTERN MARKET

European consumers have rather reserved attitudes towards entomophagy. A number of factors have an impact on the acceptance of insect-based products, from availability, added value of perceived benefits and risks of consumption, availability of information about the production itself and the quality of product. Consumers more easily accept new products if there is trust in the claims of institutions, manufacturers,

researchers and users of the product in order to overcome previous attitudes and opinions regarding insects (i.e. unsanitary), social influence and feelings of fear, revulsion and indifference [2].

Current market challenges are increasing consumer awareness about the safety of grasshoppers as food, increased diversity of insect food, favorable prices of finished products, effective management of food waste and introducing legislation that facilitates international trade in edible insects [15]. According to Payne, C et al.: "Promotion, especially towards young consumers, appears to be key determinants of building wider social acceptance of entomophagy and facilitating the adoption of a locust-based diet. In the commercial sector, insect farms and insect products are financially viable, and investor capital has made it possible to emerge many new insect food companies" [16]. Consequently, Gołaszewska et. al. state: "These observations indicate that social awareness of entomophagy needs to be improved to encourage consumers to try insect-based products and the introduction of insects into the food industry" [2].

Consumer awareness of insect food is mainly determined by availability, food knowledge, food taboos, experience and ideology. It is necessary to invest efforts in consumer education, primarily in informing consumers that grasshoppers are safe for human consumption and that they represent an alternative source of safe food with a positive impact on the environment [2].

FUTURE

Since insect-based nutrition is still taboo in Western countries and insects are not yet accepted as food, it is necessary to address consumer education to ensure the acceptance of grasshoppers as a source of new food and encourage the development of this food industry [2].

In the locust-based food industry, it is necessary to ensure that the final product is attractive in terms of texture, smell and taste. In order to successfully present locust products, it is necessary to work on a better understanding and research of the properties of locust proteins and the development of products based on them, along with constant consumer education.

Although awareness of entomophagy in Western countries is still low, growing grasshoppers as a sustainable source of food represents great potential, but more efforts are needed to raise the level of awareness and accept the consumption of grasshopper products among consumers [2].

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HALAL PRODUCTION OF OMEGA 3 ENRICHED EGGS ON THE FARM PEĆIGRAD, B&H

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Abstract
The aim of this research is to develop a functional food and halal Omega 3 eggs by dietary manipulation of laying hens as well as to investigate the influence of nutrient composition on egg yolk content of PUFAs.
The research was conducted on the farm Pećigrad, Velika Kladuša, which has 21,162 laying hens, with an egg production rate of 70%. Laying hens were fed with halal and NON GMO feed mixtures from three suppliers.
Omega 3 eggs contained 318 mg of Omega 3 PUFAs, which is 6 times more than the standard eggs.The n-6:n-3 PUFAs ratio was 18.4:1.9=9.9 in egg yolks of laying hens fed with standard feed mixture, while in egg yolks produced by laying hens fed with feed mixture enriched with flaxseed this ratio was 17.8:5.3=3.4. Consumption of eggs with the latter n-6:n-3 ratio can prevent cardiovascular diseases and provides the intake of RDA of Omega 3 FAs.
Traceability and established HrCCP in the chain of suppliers, in processes of primary and industrial production, application of good practices, sustainable development resulted in halal products with additional functional properties.

Keywords: omega 3 eggs, functional food, NON GMO product, halal product.
JEL codes: L66

INTRODUCTION

The energy and biological value of a food depends on the amount and mutual relationship of individual nutrients contained in it. Functional food satisfactorily demonstrates a beneficial influence on one or more target functions of the organism, above and beyond the corresponding nutritional effects, in a way that contributes to either good health or disease risk reduction. In that product, bioactive, functional components will be concentrated, or particularly energetically and biologically favorable products will be produced. The applied technology enables the production of food with fewer calories, less fat, with a changed ratio of fatty acids, less salt, increased nutritional density, which suits not only each group of consumers, but also

their subgroups. This product can be plant and animal foods with a changed percentage of fats, fibres, proteins, vitamins and minerals. There are five approaches to making food functional: elimination of an ingredient that has a harmful effect; increasing the level of a natural ingredient of some food to reach a concentration that can have the desired effect; the addition of a substance that is not a common ingredient of a food, but whose beneficial effects have been proven; replacement of a macronutrient, whose intake is usually excessive and causes harmful consequences, with an ingredient that has a positive effect on health; and increasing the bioavailability of ingredients that have been proven to have positive effects on health. A number of epidemiological and controlled experiments have reported an inverse relationship between consumption of n-3 polyunsaturated fatty acids (PUFA) and cardiovascular disease risk (Bang et al. 1980; Kromhout et al. 1985; Kinsella et al. 1990; Pauletto et al. 1996; Leaf and Kang 1998). The Western-world diet is deficient in n-3 fatty acids and high in n-6 fatty acids mainly because of increase of consumption of vegetable oils such as sunflower, corn and safflower oils, which are rich in n-6 polyunsaturated fatty acids (PUFA) (Simopoulos and Robinson 1998).

Chicken eggs are an inexpensive source of high-value nutrients present on the table every day, the only nutritional deficiency of which can be a relatively high cholesterol content and a high proportion of saturated fat compared to unsaturated fatty acids. The composition of fatty acids in eggs can be changed by modifying the composition of fatty acids in the hen's diet. Such changes have been demonstrated in many studies (Caston and Leeson 1990; Cherian and Sim 1991; Caston et al. 1994; Cherian et al. 1995; Nash et al. 1995; Ayerza and Coates 1999). Currently on the market, n-3 enriched eggs are produced by including flax seeds, chia seeds, fish oil or flour and seaweed in the hen's diet. Both mentioned seeds are rich in α-linolenic acid, while marine sources contain long-chain n-3 acids, docosahexaenoic (DHA) and eicosapentaenoic acid (EPA).

Of the components used in the diet of hens to produce eggs rich in n-3 PUFA, only flax (Linum usitatissimum L.) and chia (Salvia hispanica L.) are produced by traditional agricultural methods. These two species have the highest concentration of n-3 α-linolenic acid (Oomah and Kenasehuk 1995; Coates and Ayerza 1999, 2000).

There have been many attempts to use flax as a source of n-3 fatty acids in poultry diets due to the low price and its availability. Despite the fact that flaxseed does not contain DHA, eggs contain this acid due to the process of synthesis of DHA from the precursor linolenic acid under the influence of two enzymes: desaturase and elongase (Cherian and Sim, 1991). The increase in PUFA content in the yolk is accompanied by a significant decrease in saturated fatty acids, resulting in a healthy fat profile and more nutritious eggs. It is assumed that this effect is realized by a diet with a plant supplement that could help in more efficient transformation of a-linolenic acid into DHA. In addition, Bean and Leeson (2003) reported that birds consuming flaxseed simultaneously had higher ($P<0.0001$) amounts of linolenic acid, DHA, and total n-3 PUFA in their eggs. According to Cherian and Sim (1991), PUFA (n-6 and n-3 series) in the diet are more effective in reducing monounsaturated than saturated acids in eggs, through the inhibition of desaturase enzyme activity to produce mainly oleic acid. In this study, it was shown that a rich source of PUFA such as flaxseed results

in significantly lower concentrations of monounsaturated acids (MUFA), mainly oleic.

A number of researchers have reported a fishy odor or taste in eggs produced by hens fed seafood (Jiang et al. 1992; Van Elswyk et al. 1992; Caston et al. 1994; Nash et al. 1995; Van Elswyk et al. 1995; Scheideler et al. 1997) and this is the consequence of oxidation of polyunsaturated fatty acids (Jiang et al. 1992; Van Elswyk et al. 1995; Cherian et al. 1995). Other researchers, however, suggest that fish odor arises from lipid and non-lipid substances present in the food (Leskanich and Noble 1997). In any case, this negative side effect is avoided by adding flax seeds to the feed of laying hens.

In conditions of quantitative and qualitative lack of food, we are witnessing the increasingly frequent use of GMO raw materials and food. A special problem related to GMO-based food is the assessment of its risk to human health. There are several questions that must be considered during the assessment of the safety of using new plant varieties obtained by genetic modifications: the content of natural toxic substances, the potential of transferring allergens from one source to another, the concentration and bioavailability of important nutrients, the possibility of gene transfer from GMOs to microorganisms of the digestive tract, identity, composition and biological value of modified carbohydrates or fats. This technique can improve agronomic and quality properties such as nutritional value, composition, taste, smell, reserve substances, resistance to some diseases, herbicides, tolerance to stressful conditions. In agriculture, genetic engineering has become very important, and is most often applied to wheat, rice, corn, tomatoes, etc. Some authors advocate the thesis that genetic modification, genetic engineering, is a radical and dangerous change in the genetic structure of food that can result in unexpected phenomena, e.g. due to the appearance of toxins, allergens and damage to the consumer's immune system. The allergic reaction is most often related to proteins, and less often to smaller molecules, e.g. haptens. Genetic modification creates unrecognizable proteins in the human body, so it can be determined that GMO products have the characteristics of an allergen. A person can react to these unrecognizable proteins with an allergy and even anaphylactic shock. The dangers of releasing GMOs into the environment can be greater than radioactive radiation and the release of chemicals because GMOs can reproduce, multiply, spread, mutate and transfer their genetic material to related organisms. Therefore, it is extremely important to use NON-GMO raw materials in the production chain of potential functional food.

Halal quality implies a set of applied procedures in the production process as well as the totality of product characteristics that are in accordance with Islamic regulations and determine both the product and the service acceptable for use or consumption by all consumers who want to know what they are eating. Today's trends have shown that the market has recognized Halal food as a kind of guarantee of premium quality. In the standardization of halal, a proactive preventive approach is applied to prevent the possibility of haram entering the entire production process.

The aim of this research was to examine the influence of adding flax seeds to feed for laying hens on the fatty-acid composition of eggs, as well as the ratio of n-6:n-3 polyunsaturated fatty acids, and in this way potentially develop a new functional and halal product - "omega 3 enriched halal eggs".

MATERIAL AND METHODS

The research was conducted on the farm Pećigrad, Velika Kladuša, which has a total of 21,162 laying hens, with a laying capacity of 70%. Hens were kept in cages, separately for the production of regular table eggs and omega 3 enriched eggs. For the production of omega 3 eggs, the flock numbered 7,000 hens, and the rest were fed with a standard feed mixture. The feeding regimen for all hens was the same, 120 g/laying hen/day. In the event of increased breakage and shards due to the thin egg shell, calcium is included as a dietary supplement. The number of chicken deaths was 2-3 per day, which is in the expected percentage of mortality.

The egg producer proved that he does not use haram raw materials (all mixtures were of halal and NON GMO status), as well as that the production process is carried out in accordance with halal requirements. A halal product requires, in addition to precisely defined raw materials, also appropriate processing, preparation, packaging, labeling, storage and transportation.

For the production of table eggs, a standard feed mixture was used, the declared basic chemical composition of which is shown in Table 1.

Table 1. Chemical composition of fodder for the production of table eggs

Chemical component	Value (%)
Proteins	16,9
Fats	6,6
Calcium	2,9
Phosphorus	0,4

Table 2 shows the nutritional components contained in the feed mixture for the production of omega 3 eggs. Carophyl Yellow 10% (0.001%) and Xamacol (0.040%) were added to the mixture in order to prevent less intensively colored yolks in hens fed with a mixture enriched with flax seeds, because lutein and zeaxanthin give the natural yellow color.

Table 2. Content of nutrient components in the feed mixture for the production of omega 3 enriched eggs

Nutrient component	Content (%)
Maize - 6,8 % SB 2018	55,364
Soybean meal - 45 %	27,742
Soybean oil - refined	0,921
Flaxseed - ekstruded	5,5
Sea salt	0,226
Coarse calcite	5,5
Limestone	2,984
Baking soda	0,15
Mono-potassium phosphate	0,833
px-NSK - 0,5%	0,5
Alimet - 88%	0,181

Carophyl Yellow 10%	0,001
Yellow color - Xamacol	0,04
Ronozyme Hiphos - 90 g	0,009
Choline chloride - 75% liquid	0,05

Analyzes of the fatty acid composition of omega 3 eggs were performed using the gas chromatography method at the Emona Development Center for Nutrition l.l.c. from Ljubljana, Slovenia.

RESULTS AND DISCUSSION

Table 3 shows the content of nutrients in the feed mixture enriched with extruded flaxseed, which was used for the production of omega 3 eggs.

Table 3. Content of nutrients in the feed mixture for the production of omega 3 eggs

Ingredient/substance	Unit of measure	Value
Crude protein	g/kg	175
Crude fat	g/kg	53,34
Crude fiber	g/kg	32,25
Raw ash	g/kg	123,30
Metabolic energy	MJ/kg	11,50
Metabolic energy	kcal/kg	2.747, 26
Phosphorus - total	g/kg	5,3
Phosphorus - usable	g/kg	4,53
Calcium	g/kg	38,5
Magnesium	g/kg	2,14
Potassium	g/kg	7,89
Sodium	g/kg	1,70
Chlorine	g/kg	1,9
Iron	mg/kg	108,42
Manganese	mg/kg	115,94
Zinc	mg/kg	108,46
Copper	mg/kg	20,47
Iodine	mg/kg	1,01
Selenium	mg/kg	0,36
Iron - inorganic	mg/kg	50
Copper - inorganic	mg/kg	12,5
Zinc - inorganic	mg/kg	80
Manganese - inorganic	mg/kg	101,68
Cobalt - inorganic	mg/kg	0,32
Selenium - inorganic	mg/kg	0,25
Lysine	g/kg	8,94
Methionine	g/kg	4,1
Methionine+cystine	g/kg	6,72

Threonin	g/kg	6,28
Tryptophan	g/kg	1,98
Real preb lysine	g/kg	7,65
Real preb methionine	g/kg	3,85
Real preb cystine	g/kg	2,13
Real preb threonine	g/kg	5,31
Real preb tryptophan	g/kg	1,65
A	IE/kg	11.286,75
D-3	IE/kg	3.200
E	mg/kg	34,43
K	mg/kg	6,11
Biotin H-2	mg/kg	0,27
Thiamine B-1	mg/kg	1,86
Riboflavin B-2	mg/kg	7,1
Pyridoxine B-6	mg/kg	5,27
B-12	mg/kg	0,03
Niacin	mg/kg	42,89
Ca pantothenate	mg/kg	13,33
Choline	mg/kg	375
Folate	mg/kg	0,63
A - added	IE/kg	10.000
D-3 - added	IE/kg	3.200
E - added	mg/kg	25
K - added	mg/kg	6,11
Biotin H-2 - added	mg/kg	0,10
Thiamine B-1 - added	mg/kg	1
Riboflavin B-2 - added	mg/kg	6,24
B6 pyridoxine -added	mg/kg	2,5
B 12 - added	mg/kg	0,03
Niacin - added	mg/kg	0,53
Ca pantothenate - added	mg/kg	10
Choline -added	mg/kg	375
Folate - added	mg/kg	0,5
Linoleic (18:2, n-6)	g/kg	17,05
α-linoleic (18:3, n-3)	g/kg	10,05
Color	g/kg	0,03

The feed mixture qualitatively fully satisfied the metabolic needs of laying hens, and the addition of extruded flaxseed resulted in a ratio of polyunsaturated fatty acids - linoleic from the n-6 series and α-linolenic from the n-3 series of 17.05:10.05=1.70. Table 4 shows the fatty-acid composition of ordinary table eggs and omega 3 eggs. Compared to ordinary table eggs, omega 3 eggs contained more unsaturated fatty

acids, especially those with more double bonds and 2.78 times more of those from the n-3 series.

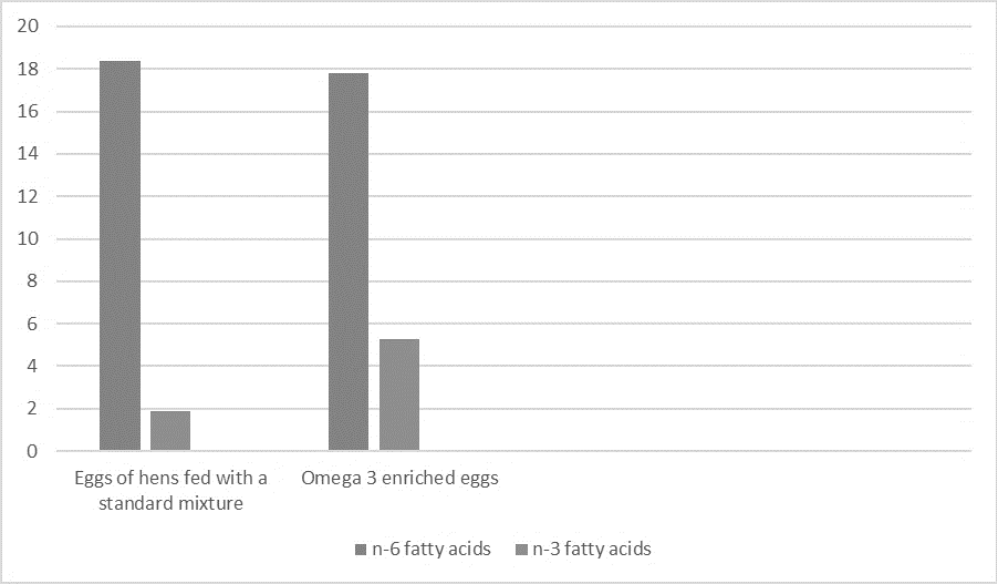
Table 4. Fatty acid composition of ordinary table eggs and omega 3 eggs

1. Fatty acid (formula)	Fatty acid (name)	Consumable eggs (%)	Omega 3 eggs (%)
C 14 : 0	Myristinc	0,4	0,3
C 14:1	Myristoleic	0,1	0,1
C 15:0	Pentadecane	0,1	0,1
C 16:0	Palmitinc	24,1	21,0
C 16:1 c+t	Palmitoleic	3,6	2,6
C 17:0	Margarine	0,1	0,2
C 18:0	Stearic	7,1	7,7
C 18:1 c+t	Oleic	41,9	42,6
C 18:2 c+t, n-6	Linoleic	14,7	15,0
C 18:3 c, n-6	y-linolenic	0,2	0,1
C 19:0	Nonadecane	-	<0,1
C 18:3 c, n-3	α-linolenic	0,6	2,9
C 20:0	Arachidin	<0,1	<0,1
C 20:1 c+t	Eicosaenic	0,2	0,2
C 20:2 n-6	Eicosadiene	0,1	0,1
C 20:3 n-6	Homo-g-linolenic	0,2	0,2
C 20:4 n-6	Arachidin	2,5	2,1
C 20:3 n-3	Eicosatrienic	-	0,1
C 20:5 n-3	Eicosapentaenoic (EPA)	<0,1	0,1
C 22:4 n-6	Docosatetraene	0,2	0,1
C 22:5 n-6	Docosapentaenoic	0,5	0,2
C 22:5 n-3	Docosapentanoic	0,2	0,2
C 22:6 n-3	Docosahexaenoic (DHA)	1,1	2,0
Unidentiefied peaks		2,1	2,2
Total area		100,0	100,0
∑ n−3		**1,9**	**5,3**
∑ n−6		**18,4**	**17,8**
n-6 / n-3		**9,9**	**3,4**
Monounsaturated (MUFA)		45,8	45,4
Polyunsaturated (PUFA)		20,3	23
Saturated (SFA)		31,7	29,2
Unsaturated (UFA)		66,1	68,4
PUFA / SFA		2,1	2,3

One of the very important parameters in evaluating the fatty acid composition of eggs is the ratio between n-6 and n-3 polyunsaturated fatty acids. In the case of eggs produced by laying hens fed with a standard feed mixture, this ratio was 18.4 : 1.9 = 9.9, i.e. about 10, while in the case of eggs produced by laying hens fed with linseed enriched feed mixture, the ratio was between n-6 and n-3 polyunsaturated fatty acids was 17.8 : 5.3 = 3.4, or about 3 (Graph 1). This ratio in the omega 3 enriched eggs

produced in this study is even lower than the 4:1 ratio reported by Kouba and Mourot (2011).

Figure 1. Comparison of the content of n-6 and n-3 polyunsaturated fatty acids in ordinary consumption eggs and in omega 3 enriched eggs.



Numerous studies show various health benefits of consuming eggs enriched with n-3 polyunsaturated fatty acids, especially in people with cardiovascular diseases, and they have the status of a functional food. Some of the benefits of consuming eggs with a lower ratio between n-6 and n-3 polyunsaturated fatty acids include reducing risk of many chronic diseases (Simopoulos, 2002; Harris et al., 2006), beneficial effects in patients with rheumatoid arthritis (James and Cleland, 1997), reduction of pro-inflammatory cytokines (Cotogni et al., 2011), reduction atherosclerotic changes and general anti-inflammatory effect (Hagi et al., 2010). In addition, Simopoulos (2011) indicated that a lower ratio of omega-6 : omega-3 fatty acids is important for homeostasis and normal development of organisms. The development of visual and cognitive functions in fetuses and young children is associated with an adequate intake of n-3 PUFA, especially DHA and EPA. The content of these acids in omega 3 eggs was 2 and 0.1%, respectively. At the same time, the content of DHA in omega 3 eggs was almost twice as high as in ordinary table eggs (Tab. 4).

The Omega 3 egg, produced in our experimental setup, contains 318 mg of n-3 PUFA, which is about six times more than a regular table egg. The consumption of such two omega 3 eggs can significantly contribute to the recommended daily intake of n-3 PUFA, which is 900 mg/d/2000 Cal (Hibbeln and Davis, 2009).

Researchers report that chickens fed by flaxseed show reduced growth compared to those fed a conventional diet (Caston et al. 1994; Scheideler and Froning. 1996; Novak and Scheideler, 2001). Birds fed by flaxseed have also been reported to exhibit diarrhoea resulting from accelerated intestinal peristalsis (Scheideler and Froning. 1996; Gonzalez-Esquerra and Leeson 2000). A high rate of peristalsis could reduce

the bird's ability to digest and absorb most nutrients. It is also important to note the presence of anti-nutritive cyanogenic glycosides and antagonists of vitamin B6 (pyridoxine) present in flaxseed (Kung and Kummerow 1950; Homer and Schaible 1980; Bhatty 1993; Bond et al. 1997). Because of all the above, the percentage of linseed used in the diet of our chickens is strictly calculated to avoid potential toxic and anti-nutritional effects. It has been proven that the use of 5% flaxseed in the total diet increases the percentage of omega-3 fatty acids in eggs but at the same time decreases the percentage of omega-6 fatty acids (Ferrier et al. 1995; Bean and Leeson 2003; Ansari et al. 2006; and Yalcin and Unal 2010), which is also confirmed by our results (Tab.4).

In the end, it is important to point out that the certification by the B&H Halal Quality Certification Agency, the verification of the List of Halal Certified Products, confirmed that the following products are on the list and bear Halal status: fresh eggs of S, M and L class, fresh eggs of commercial called M Bazar 30/1 and 10/1, XL class, and omega 3 enriched eggs.

CONCLUSION

The addition of extruded linseed in the amount of 5.5% to the feed mixture of laying hens increased the PUFA content in the eggs, especially those of the n-3 series, which resulted in an even more favorable n-6 : n-3 PUFA ratio from current official recommendations. By consuming two omega 3 enriched eggs produced in this way on a daily basis, the recommended daily amount of omega 3 fatty acids, which are necessary for the optimal functioning of the body, is consumed. Furthermore, this concept achieves uniqueness on the B&H market, which is more of an argument for a good consumer reaction, regardless of the slightly more expensive product. Through traceability and established HrCCP in the chain from suppliers, processes in primary and industrial production, application of good practices, sustainable development, a halal product with additional functional properties - "omega 3 halal eggs" was obtained.

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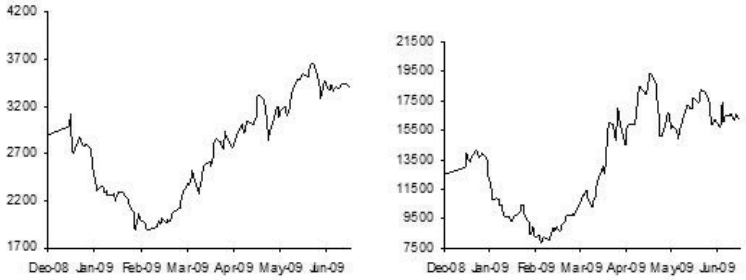

Tabela 1. Deskriptivna statistika prihoda na hartije od vrijednosti

	Austrija	**Francuska**	**Njemačka**	**Mađarska**	**Poljska**
Srednja vrijednost	-0.002%	-0.006%	-0.009%	0.008%	0.012%
Medijan	0.011%	0.013%	0.039%	0.025%	0.010%
Maksimum	12.759%	13.149%	11.125%	17.410%	10.870%
Minimum	-11.164%	-11.301%	-8.666%	-19.110%	-11.850%

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3. Shachmurove, Y. (2001) Optimal portfolio analysis for the Czech Republic, Hungary and Poland during 1994-1995 period, *CARESS Working Paper No. 00-12*
4. Gwin, C.R. (2001) *A Guide for Industry Study and the Analysis of Firms and Competitive Strategy.* Preuzeto sa sajta: http://faculty.babson.edu/gwin/indstudy/index.htm.
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Figure 1. Belex 15

Table 1. Descriptive statistics of income on securities

	Austria	France	Germany	Hungary	Poland
Average	-0.002%	-0.006%	-0.009%	0.008%	0.012%
Median	0.011%	0.013%	0.039%	0.025%	0.010%
Maximum	12.759%	13.149%	11.125%	17.410%	10.870%
Minimum	-11.164%	-11.301%	-8.666%	-19.110%	-11.850%

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