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ABSTRACT BOOK

Food Safety and Its Influences to International Trade

Oral Presentation

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Communicating with Consumers: How to Talk About Food Risk

Oral Presentation

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The increasing availability of food and health information does not always improve people's knowledge. However, it does present them with the obligation to understand in order to make choices. This creates a greater need for trust in food and health information, which can only come from presenting balanced information from credible sources that addresses the questions people have and communicating it in a way that the general public will understand.

Today's digital environment characterised by the proliferation of mobile devices, makes possible an immediacy of the information, but also contributes to the information overload. Social media opens the doors for a direct dialogue with consumers and allows everyone to be a source of information. The consequence of all those elements is emotional discussions that start replacing fact-based debates, sensationalist headlines get prominence and uncredentialed sources of information succeed in undermining trust in science and increasing the uncertainty and complexity of consumer decision making.

A proactive approach to communicating about food would help to reassure the public about its safety, restore consumers' trust in the authorities charged with regulating it, and help people understand how to eat safely and healthily. This presentation will introduce a recent publication from the European Food Information Council "How to talk about food risk", a practical handbook that aims to guide communicators through a sequential step-by-step process for developing and implementing a proper risk communication strategy. This includes a systematic evaluation of the risk, the environment, and a self-analysis of the communicator; tools for understanding audiences and developing targeted messages and content; communication channel selection; and the importance of monitoring public response.

New Food Safety Laws-FSMA

Oral Presentation

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The Food Safety Modernization Act (FSMA) was signed into law by President Obama in 2011. The main themes are prevention, import safety, inspections, compliance and response and enhanced partnerships. U.S. importers are now responsible for ensuring that their foreign suppliers meet U.S. safety standards. There is a Voluntary qualified importer program (VQIP). The law requires food from abroad to be as safe as domestic food.

Compliance dates range from 2016 to 2019, but there are later compliance dates for small suppliers.

Key Principles: The focus is on gaining industry compliance and reducing the risk of foodborne illness. İt is not a “One Size Fits All” approach and there is a recognition that not all situations are equal relative to risk and potential for public health impact. The law encourages industry to comply and make corrections on its own in a regulatory strategy that is dynamic.

FDA may conduct inspections of foreign facilities using a risk-based approach. The primary factors contributing to a facility risk profile include the following: the food safety risk associated with the commodity (the type of food), the manufacturing process, and the compliance history of the facility, such as refusal rates for products that were denied entry into the United States. In addition, section 201 of FSMA requires FDA to identify high-risk facilities and allocate resources to inspect facilities according to the known safety risks, and includes several other factors to consider when developing a facility’s risk profile.

In addition to meeting the requirements of U.S. food regulations including food facility registration, importers must follow U.S. import procedures as well as the requirements of Prior Notice.

FSMA contains provisions to provide for international communications and engagement.

IFS Global Markets Program

Oral Presentation

Nevin Rühle
IFS, Germany

What is IFS?
IFS Standards are uniform food, product and service standards. They ensure that IFS-certified companies produce a product or provide a service that complies with customer specifications, while continually working on process improvements. IFS aims to ensure comparability and transparency for the consumer throughout the entire supply chain, and to reduce costs for suppliers and retailers.

What is the IFS Global Markets Program?
To introduce a food safety system and to maintain this in daily business, can be a big challenge for smaller and less developed companies due to their size, missing technical expertise, missing financial means or type of activity.

The program was developed for food processing companies or those that package loose food products. To help companies on the way to a complete food safety system, IFS Global Markets offers a stepwise concept.

By implementing the program the manufacturer not only improve his internal processes, he also improve his reputation as a producer of safe and high quality products. Frequently, IFS Global facilitates markets access to - in the first step – regional Markets. Has a company decided to work with the IFS Global Markets Program, the responsible persons can download various supporting documents free of charge on the IFS Website.

The IFS Global Markets Program was developed in April 2014 to assist companies in the implementation and approval of effective food safety and quality assurance processes and to gradually develop a full product safety and quality management system. Based on the GFSI checklist the IFS Global Markets Food is a non-accredited development and evaluation program focusing with a stepwise increasing intensity on food safety and quality management system, good manufacturing practices and HACCP. Companies working with IFS Global Markets can choose between two different entry levels: basic and intermediate. Herewith the program is suitable to facilitate step by step implementation of the GFSI benchmarked IFS Food Standard.

As all IFS Standards and Programs the Global Markets program was developed in cooperation with international working groups and representatives from different steps of the supply chain. By that the IFS tries to consider all needs in the development process. During the last four years the number of companies implementing IFS Global Markets Food requirements increased to 1030 in 11 countries end of 2017. 216 of these companies were located in Turkey.

What will we present?
In her presentation Nevin Rühle, IFS Director for Market Development, presents the program by looking at a company which is already working with the IFS Global Markets Program.

Challenges, chances and assistance from IFS will be presented. A special focus will be on • Visibility and facilitation of market access
• Acceptance along the whole supply chain
• Continuous improvement via the differentiated IFS scoring

• Recognition by trade partners worldwide
• Visibility in the IFS Database
• Multilingual implementation tools through guidelines
• training, webinars and e-learning
• Measurable improvement of processes and thus prevention • and decrease of costs

Furthermore Nevin Rühle presents the main IFS tools to support companies in the implementation process and their daily work.
These tools are:
• IFS Guideline as implementation help

• IFS Trainings • IFS App
• IFS Database

What will you learn in the presentation?
The presentation shows you what a company has to consider when implementing a food safety system. Furthermore it tells which challenges quality managers are confronted with by dealing with food safety management systems, Good Manufacturing Practice and HACCP.

Keywords: IFS, Global Markets, smaller and less developed companies

Forensic Sciences and Food Safety

Oral Presentation

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Food safety refers to limiting the presence of those hazards whether chronic or acute, that may make food harmful to the health of the consumer. The concept of food safety is becoming more and more important since the number of food poisoning that threatens human health is quite high. In Turkey, according to the statistics of the Turkish Ministry of Health, 108,246 people were hospitalized due to foodborne poisoning in 1993-2005. Especially schools, hospitals, workplaces, military units and factories, and street vendors are the most common places for food poisoning. Food safety is about producing, handling, storing and preparing food in such a way as to prevent infection and contamination in the food production chain, and to help ensure that food quality and wholesomeness are maintained to promote good health. Ensuring food safety is becoming increasingly important in the context of changing food habits, popularization of mass catering establishments and the globalization of our food supply. For all these reasons, people are more sensitive about food hygiene and have begun to approach the concept of food more scientific. As a result of this, the factors that are considered when purchasing food and drink are increasing and the sensitivity to these issues is increasing. In Turkey, the number of studies on microbiological level of ready-to-eat foods is very limited. We have conducted microbiological studies in various districts in this field in terms of Forensic Sciences for school canteens and products of different ready-to-eat food companies. Because with such scientific studies, attention to personnel training and hygiene, careful supervision by the relevant institutions and urgent realization of case reports of food poisoning will contribute to the solution of the problem. In addition, it is important to carry out training on food safety in schools and to support them with videos and books. We plan to improve our work in this respect by presenting different works on this subject. In this way, we aim to improve students ' knowledge, behavior and attitudes about food safety in a positive way. The aim of our study is to contribute to food safety through microbiological and educational studies in the field of Forensic Sciences.

Keywords: Forensic Sciences, Food Safety, Human Health

Food Law in the Light of Judicial Decisions

Oral Presantation

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Food Law In The Light Of Judicial Decisions

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OBJECTIVE: The aim of this study is to increase the predictability of the outcome of the legislation, in particular of the people who are involved within the process such as consumer, producer, distributor etc., by presenting the progress of the court decisions given in the area of Food Law and Food Safety. Considering that the studies carried out in the field of Food Law in our country are mainly carried out within the framework of European Union legislation and the Turkish court decisions are subject to rare investigations, this study aims to provide a more comprehensive case study in the light of current legislation.

METHOD: In this study, the decisions of the Court of First Instance and the Court of Appeal were used, which were particularly relevant to the current regulations and accepted as important in the sectoral sense. In addition, other legal reviews on these decisions -if there is any- have also been subject to scrutiny, both legally and technically.

FINDINGS: The technical sense of inadequacy of Court of First Instance decisions is puzzling when the large number of judgments ruled by the Court of Appeal and the reasons for the reversal are taken into consideration.

RESULTS: It is noteworthy that specialization in the courts became necessary when considering the reversal rates and the deficiencies which caused the reversal by the Court of Appeal. In addition, the importance of the balance of rights between consumers and producers in the context of Food Law has been established. Because these regulations should not create a situation against the consumer nor should it cause the industrialists to avoid from the production because of the sanctions that they may face.

Keywords: food law, regulations, judicial decisions

The Importance of Collective Provision of Food Safety and Data Security in the Digital Age

Oral Presantation

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When food product is purchased, consumers want to be sure that it is suitable for human consumption and safely produced in good quality. Food must be produced immune from any physical, chemical or biological contaminant and be delivered to end user under cold chain when necessary. Fruits and vegetables, meat, fish and dairy products in the market in the form of frozen or close to freezing point are within this scope. For food safety, temperature limits should not be exceeded during the distribution of food. This is important for quality assurance. Furthermore, condition of product throughout the distribution must be verified for future, and continuously monitored to detect problems.

Temperature is a key parameter in food safety such as, relative humidity and total polar material for dry food and frying oil, respectively. To ensure correct measurement, effecting factors must be predefined. The main factors are: selection of correct measurement instrument, instrument's compliance of the standards, user's training level, and certification of the instruments by accredited calibration laboratories.

The methods in measurement can be classified as random/spot or nonstop/ongoing recordings. The measurement can be done by either mobile or stationary instrument in compliance with standards mentioned above.
As technology advances, measurement instruments and methods evolve towards digital food safety and quality management systems. The main logic behind digital systems are: (1) stationary and user-supported mobile measurement instrument that collects data on site; (2) transferring of these data to intermediate elements (hand terminals, tablets) through communication protocols such as Bluetooth, Wi-Fi and NFC; (3) then, automatic transfer of data to the Cloud or user's server through Wi-Fi or Ethernet; (4) management of quality-related data (digital control lists inhibiting measuring parameters, monitoring cold-frozen areas) from a single center. By these systems, it is possible to ensure data integrity, traceability, to be in compliance with legal standards; to minimize human errors; to establish alarm limits; to end paper waste; and consequently, to minimize food waste and loss.

In addition to standard temperature measurements, instruments so called "spy" can be used during transportation or storage of the food by the owner. In the absence of digital applications, paper print-outs from analogue devices are used to evidence the temperature levels. In case of a problem, this data should be provided to the court as evidence in case of dispute. Unfortunately, most of the time, measurement values are not being submitted to the court. The measurement conditions or accuracy of the measurements provided by analogue instruments can be suspicious. The brand and model number of the measurement instrument, the measurement point, range of measurement and the accuracy of the measurement, and above all, the calibration certificate of the instrument should be submitted to the court together with the data. Then on measurements can be significant; and as a result, can be accurately evaluated by experts.

Even though Cloud-based new technologies provide great convenience in digitalization process, it also brings in new questions: how to provide data security and how to build legal infrastructure on this information?
There are two problems: to prevent data loss and to protect data from access of third parties.

The server of the Cloud must be certified and in compliance to national and international standards (PCI DSS, ISO 27001 and 95/46/EC). Even the server/Cloud provider has no access to data. It is unknown how these digital data stored in Cloud can be used as legal evidence. Herein, traceability and safety of data stored on a digital platform and its usage by courts for determination of responsible part in case of any dispute are discussed.

Keywords: food safety, quality management, digital quality management, food waste, data security, traceability

Food Fraud Prevention: The Role of Super Controllers

Oral Presantation

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INTRODUCTION: Food fraud, including the subcategory of economically motivated adulteration, is a global problem that can have devastating economic effects and poses considerable risks to public health, safety, and food security. On January 1, 2018 the Global Food Safety Initiative (GFSI) Food Fraud Requirements went into effect making organizations accountable for food fraud prevention. In order for a company to be GFSI compliant they must perform a food fraud vulnerability assessment and have a control plan in place.

PURPOSE: A key component of the food fraud vulnerability assessment is an understanding of the fraud opportunity. This article proposes that routine activities theory provides a framework for understanding the food fraud phenomenon, and reviews the basic tenets and concept of the theory.

METHODS: A review of the existing criminological literature that addresses food fraud, with special attention on the theoretical perspectives drawn from rational choice theory and Situational Crime Prevention were used in the preparation of this article.

RESULTS: The presentation concludes with a discussion on how super controllers and the routine activities framework will enhance our understanding of food fraud and identifies new avenues for research.

DISCUSSION: Additionally, the article explores how super controllers, the actors that create incentives for controllers (handlers, mangers, guardians), prevent food fraud. Since the behaviors of controllers can be influenced by super controllers, the role of super controllers in food fraud prevention is significant.

Keywords: Food Fraud, Crime Prevention, Super Controllers

Impact of High Pressure Processing Extraction on Antibacterial Activity of White Tea Extracts

Oral Presantation

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Tea mainly produced as white, green, Oolong, and black is a common consumed beverage after water all around the world. White tea, an unfermented tea, is made from very young tea leaves or buds. White tea extracts (WTE) have shown as an antioxidant, antibacterial, and antifungal activities. Although there is a little information on antibacterial activity of white tea, its antibacterial activity is thought to be due to a group of polyphenols called catechins, caffeine and theobromine. However, there is no reported study about the effect of high hydrostatic pressure processing (HPP) on antibacterial activity of white tea. Therefore, effects of HPP on antibacterial activity of WTE against different microorganisms at different solid/liquid ratio under different HPP processing parameters were investigated.

Antibacterial assay was conducted by dilution method at three different concentrations (50, 150, 300 µL/mL) of HPP white tea extracts obtained by different solid/liquid ratio (0.01-0.03%), pressure (300-500 MPa) and infusion time (120-600 s) in water as an extraction solvent against Escherichia coli O157:H7 and Salmonella Enteritidis. HPP treatment is applied at room temperature and the levels of HPP parameters were determined by preliminary studies. Among the variables studied, solid/liquid ratio and infusion time showed significant effects ($p<0.05$) on antibacterial activity against E. coli O157:H7, whereas only pressure presented significant effects ($p<0.05$) on antibacterial activity against S. Enteritidis. Depending on the various process parameters, the antibacterial effect against S.Enteritidiswas 4 log cfu/mL reduction in the control samples of 6 cfu/mL initial count.($p<0.05$). Moreoover, the antibacterial effect against E.coli O157:H7 was 6log cfu/mL reduction in control samples of 7 log cgu/mL initial count ($p<0.05$). While WTE had strong antibacterial activity against S. Enteritidis with solid/liquid ratio of 0.01% at the highest pressure (500 MPa) and longest infusion time (600 s); its stronger antibacterial activity against E. coli O157:H7 was observed with solid/liquid ratio of 0.01% at the highest infusion time (600 s). Thus, it is concluded that depending on the HPP parameters and solid/liquid ratio WTE carries out the good antibacterial activity against zero tolerance foodborne pathogens of E. coli O157:H7 and S. Enteritidis.

Keywords: Antibacterial activity, white tea extracts, high hydrostatic pressure

A Novel Alternative Method in Production of Fruit Juice Concentrate: Ohmic Heating Assisted Vacuum Evaporation

Oral Presentation

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Evaporation process is the one of the main processes used in the preservation of the food products. By removing the amount of water present in the product during evaporation, some purposes such as providing the microbiologically safer product, reducing the cost of transportation and the storage area. In the food industry, evaporation process is conducted thermally under vacuum. Since it results in some quality losses and the formation of undesired components alternative techniques have been investigated in recent years. The application of novel techniques such as freeze concentration and membrane concentration is limited since they have the high capital cost and fail to achieve the desired water soluble dry matter.

In this study, evaporation process was achieved by integration of ohmic heating system into a vacuum system. Ohmic heating assisted vacuum evaporation (OVE) was applied in 3 different voltage gradients (10,12, and 14 V/cm) at 65°C. The food material was chosen as cherry juice having an important economic value for Turkey. The sour cherry juice having total soluble solid content (TSSC) of 19.2% was concentrated to 65% TSSC content. Total phenolic content (TFC) and total monomeric anthocyanin (TMA) content were determined by using Colin-Folin reagent and pH differential methods, respectively. The results were compared with those of concentrated cherry juice obtained by vacuum evaporation (VE) in the same system. SPSS 16.0 package program was used for statistical evaluation of the results. Differences between the effects of the treatments were determined by one-way variance (Post Hoc-Duncan test) analysis, according to the Completely Randomized Design.

Total phenolic content of unprocessed sour cherry juice (raw material) was determined to be 2617.63 mg/L as Gallic acid. TFC of sour cherry concentrates having TSSC of 65% obtained from OVE and VE processes were statistically different from the TFC of raw material ($p<0.05$). For better comparisons of the effects of processes, the data was arranged on dry matter basis taking into account the total solid contents, and the TFC was determined to be varied between 12179.72-13911.15 mg/L. The highest TFC was obtained in the OVE process applied at a voltage gradient of 14 V/cm while the lowest was obtained in the VE process. It was determined that the TFC of the samples treated by the OVE treatments applied at voltage gradients of 14 V/cm and 12 V/cm were similar to raw material.

On the other hand, it was determined that the TMA contents of juice concentrates were statistically different from the raw material ($p<0.05$). TMA content of the sour juice having TSSC of 19.2% was found as 518.78±18.26 mg/L (Cyn-3-glu) while it was determined as 1777-1561.67 mg/L after the evaporation process. In dry basis, TMA content was 2701.97±95.11 mg/L while it was in the range of 2422.28-2717.71 mg/L after evaporation. When OVE applications were compared within themselves, it was determined that 14 V/cm was

different from other applications but there was no statistically significant difference with raw material.

As a result, concentrated sour juice production was successfully achieved by the OVE system, and the changes of TFC and TMA contents of the sour juice concentrated by OVE and VE

methods were investigated. It was found that the highest change (loss) in TFC and TMA contents was determined for VAE application. In the application of 14 V/cm, TFC and TMA contents were similar to those of raw material. In other words, TFM and TMA contents were preserved more by OVE process than VE process since its thermal effect was lesser. This demonstrates that OVE process could be used as an alternative technique to VE process.

Keywords: Cherry juice, evaporation, ohmic, vacuum

Quality of Fresh Raspberry (Rubus idaeus L.) Fruit as Affected by Ultraviyolet-C Treatment

Oral Presantation

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Ultraviolet-C (UV-C) light treatment is a nonthermal process that can be used to inactivate microorganisms on the surface of fresh fruits and vegetables after harvest. Fresh raspberries (Rubus idaeus L.) are highly perishable fruit, but have excellent nutritional and health benefits for consumers. The effects of UV-C treatment on pH, color (L, a, b value), total bacterial count and total yeast-mold count of fresh raspberries was studied. UV-C light treatment was applied to the fruits at different doses of 33, 66 and 100 kJ/m2 each delivered at two different dose rates (low and high). The quality parameters were evaluated immediately after the UV-C treatment and also after 2 days of refrigerated storage. The UV-C treatment of 100 kJ/m2 dose at low dose rate resulted in higher pH of the berries. The UV-C treatment at the high dose rate caused significantly higher L, a and b values in the samples compared to the treatment at low dose rate. All UV-C light treatments at high dose rate resulted nearly 2 log reduction in total bacterial count and also 0,4-0,6 log reduction in total yeast-mold count compared to untreated fruits.

Keywords: quality, raspberry, ultraviolet light

Investigation of the Use of High Hydrostatic Pressure on Functional Whey-Based Beverage

Oral Presantation

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Due to the fact that whey and whey products from cheese industry are not efficiently evaluated and used in Turkey, it causes a great economical loss. Therefore, formulation of aromated functional drink with unpasteurized fresh whey, its processing by both high hydrostatic pressure (HPP) and heat, and measurement of physical, chemical, microbiological and sensory properties in order to determine shelf life are prompted in the study.
Functional drink was produced by addition of plant stanol (0.0 and 1.00%), stabilizator (0.7%), aroma (75 µL/mL), colorant (20 µL/mL) and sugar (%3), and based on the initial experiments to determine pressure and processing duration the samples were separated into three group as control, HPP processed (200 MPa-5 min, 400 MPa-5 min and 600 MPa-5 min) and heat processed (85 °C 15 min). Depending on the applied pressure and processing time, initial processing temperature of the samples, 22±2°C, increased by 10°C. After processing, the samples were inoculated with starter cultures of Lactobacillus acidophilus and Lactobacillus casei and stored at 4 oC for 49 days after the incubation at 37 oC for 18 h. During storage of the samples pH, water activity, titratable acidity, color (L*, a* and b*), chroma, hue, total color difference, sedimentation, FT-IR profile, reological properties, particle size, zeta potential, conductivity, SDS-PAGE, metal ion concentration, microbiological and sensory properties were analyzed. In general, no significant difference was detected among the samples ($p>0.05$), but significant differences were detected for viscosity and particle size of the heat processed samples ($p\leq0.05$). The samples processed by 600 MPa for 5 min showed differences compare to other samples in sensory attributes which some of them developed depending on the storage period ($p>0.05$). It can be concluded that the formulated functional drink is a good option to evaluate whey, and HPP processing is a viable technology to extend shelf life of the formulated functional drink.

Keywords: High pressure processing (HPP), whey, functional drink, shelf life, plant stanol

Determination of the Effect of UV-C Light on the Molds Isolated from Dried Persimmons

Oral Presentation

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Ultraviolet light (254 nm) is a non-thermal intervention technology that can be used for surface decontamination of foods.In this study, it was aimed to investigate the UV-C resistance of different mold isolated from dried persimmons in vitro and also to determine the resistant mold isolates to be used as a test culture in studies on UV-C treatments.Total of 66 fungal isolates obtained from dried persimmons were incubated twice at 25 °C for 7 days in order to activate cultures.At the end of the last incubation period, 2 ml of sterile distilled water containing sterile 0.05 % (w/v) Tween 80 was transferred to the tubes containing mold cultures and vortexed for 30 seconds.Appropriate dilutions were done to prepare spore suspensions of 10^5 spores per ml and the numbers were validated by microscobic examination by using a Thoma counting grid and also plate count methods.0.1 ml of the spore suspensions were inoculated to Malt Extract Agar plates by using spread plate method to obtain initial spore count of 4 log unit per plate.Then,plates were placed in a closed UV-C chamber, at a distance of 10 cm between the UV-C light, and treated with UV-C doses at 1.2 kJ/m^2 and plates were incubated at 25 °C for 3-5 days while untreated plates were used as a control group.The resistances of molds against UV-C were ranked by K-Independent samples-Kruskal-Wallis test using IBM SPSS 20.Result obtained in this study revealed that UV-C light was found to be effective technology at different levels of inhibition of molds.While the initial numbers of spores per plate was about 4 log unit,UV-C treatment reduced the number of inoculated mold spores about ≥ 4 log unit for the 34.85 % of the isolates,on the other hand the reduction levels in the range of 2.2 -<4 log unit were obtained for the 33.33% of isolates.For the rest of the isolates (31.82%), the colonies above the detection limit were not counted and reduction levels were < 2.2 log, and the exact reductions of these resistant cultures were determined by using lower inoculation levels of about 2 log unit per plate and UV-C treatment was applied at the same dose.As a result of these treatments, 61.90% of the resistant isolates were below the detection limit.It is determined that there is significant difference between the UV-C light inhibition effects on different mold species(p <0.05).Mold species that showed the most sensitivity under UV-C treatments

are; Byssochlamys, Mucor, Geotrichum, Basipetrospora, Ulaclodium, Endomyces, Paecilomyces, Chaetomium, Penicillium, Moniella, Aspergillus, Trichothecium, Chrysonilia, Cladosporium, Monascus, Rhizopus and Alternaria, respectively.Traditionally dried food products which are open to microbial contamination and stored in inappropriate conditions could cause increase in the existing mold load and reduce the microbial quality of the product.UV-C treatment to food is environment friendly as it does not result in any waste and the process does not require any chemical agents.Owing to limited use of chemical disinfectants, appliance of UV-C systems in the food industry with optimum parameters, product safety will be ensured and economic losses will be reduced by inhibiting mold growth during storage of food and preventing possible mycotoxin production.Inhibition of mold growth on the surface of the food can be achieved by using UV-C treatments thus use of chemical

disinfectants can be restricted.In recent years, there has been an increase in publications for testing the efficacy of UV-C treatment for the inhibition of molds present on food.In this study, UV-C resistance of different molds isolated from dried persimmon was detected and it is found that resistant strains should be used as test cultures in the studies about the efficacy of UV-C applications in

foods.
Keywords: Dried persimmon, mold inhibition, UV-C light

Quick and Continuous Measurement Of Quality Variables For Bakery Products After Baking

Oral Presentation

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The color, moisture, geometry and figures are of great importance to define product quality of the bakery products. It is unable to check the continuous quality of so many products that flow at high speed on conveyors in the industrial applications manually. Additionally, it is not easy to eliminate quality defective products. Some devices; such as color-optic sorters, x-ray are used that can control and sort automatically extract some quality errors in some applications.

In order to ensure the accuracy of these products and similar quality features by existing methods, laboratory-based measurements and statistical approaches made at regular intervals are used. For this reason, process settings can be made with a delay. Some analyzes may last up to 10 minutes meanwhile the products keep flowing on the conveyors. Since the quality defects can not be corrected simultaneously, products can be caused waste or inadequate quality.

In this study; new systems that can perform simultaneous reading and evaluation of bakery products high speed. Digital cameras for color, figure and geometry; infrared sensors to detect moisture content in baked products were tested. The data obtained is processed through computers with developed software to create infrastructures that can give feedback and report.

Consecutive measurements were taken at high speed by placing devices covering conveyor width and 100 % product control has been achieved. The data obtained is compared to the reference data transferred to the computer, deviations from the defined intervals are determined, reported and feedback signals are generated. For precise color reading, dark and insulated cabin have been used. The received images were evaluated using known image processing algorithms. The product diameter, circularity and the correctness of the figures are taken into consideration with discrete color analysis of different regions of the products.

The water molecules that absorb energy (surface energy) on the adjacent layer of the surface of the product has been used for moisture control. The correlation between the surface energy and the moisture of the product made in the laboratory have been proved by a number of tests. The read data was converted into moisture data with the aid of the defined correlation and the improved software. Signals for automatic control of the process have been obtained with reference to moisture data. The obtained signals can be sent (speed, temperature, pressure, heat flux, etc.) to the related points of the process for automation.

As a result; it has been determined that faster and more continuous data can be obtained than measurements made by methods known in the laboratory. In addition, rapid processing

of the read data is expected to result in less product waste and inadequate products, via automatic controlling of the processes. It has also been observed that color measurements at different areas of complex figured products are more discriminating and sensitive than the current laboratory conditions.

Instead of known process controls; it has emerged that a product quality control system can be used that is supported by proprietary software which provide repeatable, faster and more reliable results. In this way, product quality and process control will be managed better by fast, simultaneous, continuous reading and evaluation of moisture, color, figure and geometrical properties of baked products flowing continuously and at high speed through conveyors; reports can be generated in different formats.

The quality measurements of baked products such as color, geometry, figure and humidity can be done at high speed with the new combined system. The generated signals from the sensors applied on the line can be used for automatic control of the process and reports can be generated.

Keywords: Infrared sensors, NIR sensors, color measurement, RGB, humidity measurement.

6 Gıda Güvenliği Kongresi
Food Safety Congress

Blockchain and Food Safety

Oral Presentation

PARALLEL SESSION - 2A
Novel Approaches to Food Safety

Process Validation

Oral Presentation

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Mérieux NutriSciences Corporation, USA

Validation is crucial in achieving food safety objectives. Food facilities are required to implement a written food safety plan and document that their preventive controls are working and verified. The U.S. Food and Drug Administration (FDA) defines validation as "obtaining and evaluating scientific and technical evidence that a control measure, combination of control measures, or the food safety plan as a whole, when properly implemented, is capable of effectively controlling the identified hazards." The objective of validation is to demonstrate that the critical limits established for the given control measure are able to deliver the intended hazard control. Hazards can be biological, chemical (including radiological), and physical. Understanding the science to control food safety hazards is needed to construct a successful preventive control program. Food facilities have the flexibility to customize preventive controls
in their food safety plan. Significant challenges involve determining key requirements for validation including hazard analysis and risk-based preventive controls. Codex Alimentarius identified three tasks that should be performed prior to a validation study: 1) identify the hazards to be controlled, 2) identify the required food safety outcomes, and 3) identify the measures to be validated. According to FDA, validation is ideally conducted before the food safety plan is implemented, within the first 90 calendar days of production, or within a reasonable timeframe with written justification. Validation proof can come from a variety of sources. Codex Alimnetarius lists five recognized approaches to validate a control measure: 1) reference to scientific, technical literature or previous studies, 2) scientifically valid experimental data, 3) collection of data during the food operation, 4) mathematical modelling, and 5) statistically valid surveys. FDA does not recognize surveys as a method to validate a food safety plan. When such information is not available laboratory or in-plant studies can be performed to prove that a particular process is consistently delivering the desired preventive control. Laboratory studies are generally accepted as alternatives to in-facility validations. When the preventive control measures cannot be simulated in the laboratory, an in-plant study may be conducted in a processing facility. However, the introduction of pathogens into a food plant is not advised. Therefore, a surrogate microorganism may be useful in validating the efficacy of a control measure. An ideal surrogate culture should be a non-pathogenic alternative for the pathogen of concern with similar or more robust survival characteristics under the processing conditions being evaluated. Validation trials should be conducted in "worst-case" manufacturing conditions. When it is possible, temperature mapping and cold spot determination should be conducted prior to inoculated sample trials. It is essential to generate a final report, detailing methods, tests and
results. A clear description of the objective, significance, outcome and justification for conclusion drawn should be provided. Validation is specific to intended process, hazard, critical limits, equipment and product being evaluated. Revalidation is needed when critical process parameters are changed. Examples include a significant change in the product, process and raw material, new scientific or regulatory information, system failure, reoccurrences of problems, new consumer handling practices, changes in the distribution

system, undetermined root cause of a problem and relocation of equipment. All activities of validation from hazard analysis to data interpretation should be overseen by a qualified individual.

Microbiology and NGS

Oral Presantation

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The promotion of a high level of Food Safety and Quality is a major policy priority world-wide. The globalization of the food market, the increase of personal and food transportation, and the changes in food consumption habits provide s a lot of opportunities and challenges to minimize incidence of Food Safety in the stakeholders. In recent years, several stogies have been developed to foster repid and accurate answer to the needs poed by the food insutry and consumers, being the Next generation Sequencing a very promising alternative to exploit strategies for rapid identification of foodborne pathogens and source attribution, as well as characterisation of isolates and microbial communities to address risk assessment within the microbial risk management.
In this scenario of activities, NGS can play a relevant role in several activities. Firstly, NGS can instigate a more effective implementation of alternative methods for detection, identification and quantification of foodborne pathogens. Because the classical microbiological methods are time consuming, and laborious, even not always reliable for instance the presence of viable but non-culturable VBNC forms as happens with Campylobacter. In parallel, NGS can be a pivotal tool on epidemiological studies in the food chain, which is one of the pillars of the risk assessment. For that, the first step is the determination of prevalence and contamination loads of microorganisms of interest in different food commodities. The results will allow to develop strategies for preparedness for emerging agents transmitted via food to anticipate food alerts. In addition, the prevalence and epidemiological data will also allow to design effective and fit-for-purpose sampling methods and schemes in different food commodities. Importantly mainly for unknown and unexpected agents is inexcusable the use of to identify the source attribution for particular microorganisms. In addition, it is also important to use this cut-of-the-edge tool for source localization along the food chain. A third relevant aspects in where NGS is essential is on the characterisation of foodborne pathogens for specific traits using molecular approaches. For example, once we have obtained specific potentially pathogenic isolates from different food commodities we could characterise them for the presence of specific traits by genomic approach : (multi-)antibiotic resistance properties, or virulence characterisation using NGS for the presence and gene expression of the major molecular determinants of virulence. In addition, exploiting NGS let us deeply characterise the isolates allowing establishing phylogenetical relationships. These findings will support to quality departments in the food industry to determine if the food and food environment related contaminations

are recurrent (i.e. the strains of a given microorganism obtained during several samplings in the same facility is the same isolate) or are new contaminations (i.e. although strains of a given microorganism are obtained during several samplings in the same facility, they are not the same isolate). This is a critical aspect to define cleaning and hygienic measures within the food industries, as the strategies for disinfection can be totally different. When, a recurrent contamination is found, the strains isolated are usually well adapted to the food production facilities (usually very stressing for microorganisms) and usually have the capacity to produce biofilms were are quite resistant to regular cleaning procedures.

Therefore, in that given case, the cleaning and disinfection must be more exhaustive even when the original problem (i.e. contamination with a given microorganisms) is the same. Consequently, the application of molecular tools will help dramatically to establish correct hygienic strategies in the Food Industry.

Similarly, NGS can help us on ecological studies of microbiota in food. Through this activity, using NGS, we can characterise the microbiota present in a given food or in a food environment. This is a novel and interesting approach for instant to characterise food spoilage. Usually the spoilage of a given product is produced by a misbalance on the common microbiota, and the ecological development of spoiling microorganisms. Differently to what happen with foodborne pathogens where the development of a specific microorganism produces a cascade of symptoms that finally can be clinically significant for disease attribution, the spoilage of foods is a combination of different factors in which the modifications of the microbiota can play a main role. Consequently, the definition of the microbiota of given products specially those raw or fermented or those with a slight disinfection treatment, i.e. the fingerprint of the microbial commodity, will allow both to characterise the factors influencing the spoilage and the microbial groups implied. The spoilage of foods is a research field not too studied, particularly if it is compared to foodborne pathogens research but important because of its economical important but as well as it can reduce the food shelf life that it is important for the commercialization chain, basically exportation. In addition, the funding programs both at national and international level, highlights that one of the pivotal research and socioeconomical areas of implementation must be the development of strategies to guarantee food security. Food security is not only related to the improvement of production programs, but particularly to delivery of the goods produced in good state, and consequently, the spoilage of foods therefore plays a major role.

In conclusion and summarizing what has been described above, NGS can help us to answer in an innovative, accurate and effective manner the traditional questions that affects the food safety and quality most significantly.

FoodSimplex – Food Safety Methodology For Restaurants

Oral Presentation

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The offer increase in mass caterer establishments such as restaurants, canteens, schools, hospitals and catering enterprises, arises the concerns, if the meals prepared are safe, the food business operators (FBO) have the means and the technical support and if there is a preventive action plan effective to provide food safety in medium and small companies? Billions of meals are prepared safely each day throughout the world but 22% outbreaks of food borne diseases were reported in Europe that had their origin in processed foods and/or by catering establishments. The European Union (EU) has created legal tools to ensure food hygiene in the sector, as well as official entities in charge of controlling and inspecting establishments to ensure public health. In Portugal, we have two kinds of situations that can increase the food safety concerns, namely, family business with bad handling practices, old establishment premises, to reduce bureaucracy and facilitate the establishments of the new food business, the restaurant's premises only need registration, without inspection pre-approval, to start working and the restaurants' food business operators are responsible for managing hygienic- sanitary quality and for providing safe food to clients and most of the times they don't have the knowledge to respond to the food safety EU regulations.
This study aims to assess food safety action plan created for medium and small restaurants, named FoodSimplex, as public health tool to be applied by food safety technicians.
The project was a longitudinal study which took place between 2010 and 2014, in 22 restaurants eligible.. The data collection instrument for the inspection was an audit checklist, designed to collect data through visual inspection regarding food handlers and facilities hygiene and GMP as well as through interviewing the person responsible with regard to HACCP aspects (manual of procedures, records, etc.) and it's organized in three modules divided into specific topics (items). The 352 audits were studied according to with the results and their evolution during the application of a FoodSimplex methodology
The results were analyzed taking into account the 1st and 4th audit, to assess the evolution in hygiene and GMP practices in this small and Medium enterprises. The results were statistically treated by SPSS and the McNemar test was applied to a confidence of 95%.
The results of the 1st audit highlighted significant gaps like poor hygiene of cold storage, cooking, locker rooms, handwashing sinks, 1st aid kit, dishwashers and waste treatment. In GMP were receiving inspection, labeling in room temperature and cold storage, freezing procedures and cold packaging of food. All these items presented nonconformities in more than 50% of the restaurants. After the application of FoodSimplex, the restaurants showed an evolution in compliance both in hygiene and good manufacturing practices (GMP). That means that, after systematic training and frequent audits, FoodSimplex was linked to a

change of habits: an increase of food safety and improvement of hygiene and GMP in small and medium restaurants.

Keywords: Public Health, Food Safety, Mass catering, Foodsimplex, Restaurants

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Keywords: Public Health, Food Safety, Mass catering, Foodsimplex, Restaurants

Public Health Ethics and Food Safety

Oral Presentation

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Public health ethics is a philosophy that protects/maximizes the health benefits of the people/society in any case related with health. Today many different concepts are being discussed in this perspective.
The public health ethics encompasses values and principles that guide community. It fulfills the needs of the "prevention of morbidity and mortality " approach. It separates from biomedical ethics in some points (e.g. biomedical ethics is focused on the individual rather than community; public health ethics gives priority to social benefits and collaborative work). Another issue that needs to be considered in the public health ethics debate is the "precautionary principle", which basically points out that "any condition should be treated as “harmful” unless the harmness is proved".

It seems that problems threatening food safety, which can lead to many people's illness in the world and our country, which could lead to death if measures are not taken, can easily find itself in the philosophy of "public health ethics".
The concept of food safety, is now influenced by many determinants of health. Food safety debate excluding these concepts, also known as the social determinants of health, should be considered as an “incomplete” discussion. In this context, the right to health, climate change, poverty and the challenges it poses, animal health as a basic component of “one health approach”, some tactics of the food industry, production systems and many other issues should be discussed together in public health perspective.

In the direction of the results obtained from such assessments made, solutions should be produced in the light of universal approaches. There is a need for strong and sustainable public system so that the solutions produced can be realistic at both the international and national levels. Other components may support the main system when required guided by the science.

In this presentation; it is aimed to discuss the concept of food safety in the perspective of public health ethics, to identify the problems and to propose solutions based on scientific evidence and approaches.

Keywords: Food safety, Public health, Public health ethics

One Health: A Unique Approach to Tell the Story of Food Production and Improve Consumers' Confidence

Oral Presentation

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Elanco Animal Health, France

Is One Health a buzzword or is it critical for considering the future of livestock production? We often hear the concept being referred to by regulatory agencies, opinion leaders, in position papers, articles and guidelines. The term indicates that human and animal health are interdependent and also bound to the health of the environment. The UN, OIE, WHO and FAO all acknowledge their respective responsibilities in combating diseases which have a severe impact on health and the economy, particularly animal diseases transmissable to humans.

A One Health approach is also important for food safety. For example, non-typhoidal salmonella causes significant foodborne diseases, which are the subject of strict control by government authorities. While the germ does not cause any performance loss or mortality in chickens, breeder flocks that are found positive with salmonella are being slaughtered and eggs of laying hens cannot be sold as fresh for public health reasons with very high economic cost. Keeping chickens healthy and preventing them from getting salmonella is a key focus of poultry companies to protect public health – a One Health approach.
Another example is the fight against antibiotic resistance and the use of antibiotics in farm animals. Antibiotics are important tools farmers and veterinarians use to ensure the health of animals, as well as the safety of our food supply. They are one tool among others. Farmers and veterinarians work closely together to design and implement comprehensive animal health and welfare programs that take into account quality diets, clean and comfortable housing, disease prevention as well as other factors. When antibiotics are used, they must be used responsibly (eg start with classes not used in humans as per WHO guidelines) and under strict veterinary guidance.
All stakeholders must work together in order to avoid antibiotic resistance in people while at the same time preserve the efficacy of antibiotics in livestock production – a One Health approach.
As the global population grows, so does the demand for meat, milk and eggs, followed closely by growing consumer interest in how meat, milk and eggs are produced.
Stakeholders have a responsibility to improve the availability of accurate information about food to help consumers in their choices. How can we increase consumers' confidence in the food industry by developing positive claims rather than playing with their fears?

One Health offers a way of telling relatable stories about food choices that support shared efforts to protect people, animals and the planet – underpinned by decisions, policies and actions based on science. We must make decisions that optimize the health of people, animals and the planet, not maximize one at the expense of others, or maximize profit at the expense of all three – a One Health approach.

At Elanco we bring the animal to the centre of the debate; we want to play our part to improve consumers' confidence in today's food production by proactively telling the story of

well- cared, healthy animals being at the core of a sustainable livestock production. One Health is part of our vision.

1 REGULATION (EC) No 2160/2003 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 November 2003
2 New Performance Standards for Salmonella and Campylobacter in Not-Ready-to-Eat Comminuted Chicken, February 11, 2016, Food Safety and Inspection Service

WHO GUIDELINES ON USE OF MEDICALLY IMPORTANT ANTIMICROBIALS IN FOOD-PRODUCING ANIMALS, 2017

Keywords: Elanco, One Health, consumers confidence salmonella, antibiotic resistance

Evaluation of Food Poisoning Occurrences Worldwide and Relevant Organisms

Oral Presantation

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Some specific incidences observed in recent years, are very important to understand the role of microorganisms and the production environment in food poisoning. Preparation of food under hygienic conditions, cooking at the correct temperature for a suitable time and immediate consumption prevents the growth of pathogen microorganisms considerably. However, infection related to bacteria such as Salmonella, Campylobacter and virial infections like norovirus, hepatitis A virus, are common, known food borne diseases, although their numbers differ from year to year. The number of Salmonella food poisoning cases in the European Union has been reported to have risen by 3 percent since 2014 by the EU health and food safety officials.Similarly, hepatitis E virus infections related to meat consumption has also been observed.Salmonella infections can be treated in general. Infections are brought under control in aperiod between 4-7 days.Fatal incidences are also seen from time to time however. Food poisoning events are also encountered in our country. It is known that a large number of soldiers from military troopsin different regions have been medically treated in 2017; a soldier has lost his life.

It is observed today that the eating and consumption habits of people have changed together with the production and storage methods. Thesevariations are major factors in food borne diseases originating from known pathogens as well as new pathogens.Clostridium
difficile, Cronoobactersakazakii,Helicobacter pyloriare examples of such atypical pathogens. New pathogens are specifically important since they are responsible for serious health problems targeting specific age groups like babies, elderly and people with immune system deficiency. In addition to pathogenic bacteria, observations of infections caused by protozoa have shown considerable increase recently. A great majority of these infections are related to the production of food in non- hygienic environment. Some examples of protozoa responsible for food borne diseases are: Cryptosporidium spp., Giardia, Cyclospora and Toxoplasma. The importance ofprotozoa infections is due to the fact that their symptoms, treatment methods and results are different from other pathogens; the number of infected people is much higher than expected. This paper aims to approach food poisoning incidences encountered worldwide as well as in our country from a pathogen-food-human relation point of view, thus to contribute to the solution of an important hazard.

Keywords: food poisoning, pathogens, Cronobacter, virus, protozoa

Biofilm Formation by Salmonella enteritidis on Food Contact Surfaces

Oral Presentation

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Research hypothesis: Biofilms formed in food processing environments represent a long-term source of food contamination. Existence of bacterial biofilms in these environments may cause cross- and post- process contamination. The aim of the present study was to determine biofilm forming ability Salmonella Enteritidis on glass and stainless steel surfaces. METHOD: Tests were performed with 15 isolates of S. Enteritidis (SE1-SE15). The glass and stainless steel coupons (1 x 1 x 0.2 cm) were sterilized and appointed separately into the recesses of polystyrene 12-well plate. Afterwards, 100 µL of bacterial suspension (~1-2 x 108 CFU/mL) was inoculated to surface of each coupon. Bacterial adhesion was provided during the 3h at 25/37°C. Subsequently, suspension was removed and coupons were washed with physiological saline, and submerged in 2 mL of Tryptone Soya Broth (TSB). Coupons were incubated for 48h at 25/37°C. Excess medium and non-adhered cells removed by mild pipetting with 3 mL of saline. Each coupon was placed in tube containing 1 mL of saline peptone solution. Detachments of bacteria were performed exposing tubes with coupons to low energy ultrasound for 3 minutes at 40 kHz, using ultrasound water bath. Afterwards, they were vortexed for 1 min at maximum speed and resuspended in 9 mL peptone saline solution. The number of cells that form biofilm was determined by a standard technique of colony counts on Tryptone Soya agar (TSA). Three coupons were analyzed for each tested isolates and the results were expressed as log CFU/cm2.

RESULTS: The extent of adhesion ability varied among tested isolates depending on the tested temperatures and surfaces. The results showed that tested isolates produced significantly more biofilm at 25°C.
The weakest adherence ability to tested surfaces was shown by isolates SE3 and SE8. Adhesion assay on glass surfaces showed that adherence ability of tested isolates was ranged from 1.22 log CFU/cm2 (SE3) to 2.48 log CFU/cm2 (SE8) at of 25°C, and from 1.18 log CFU/cm2 (SE3) to 1.88 log CFU/cm2 at 37°C. Adherence ability these isolates to stainless steel surfaces was ranged from 1.21 log CFU/cm2 (SE3) to 2.40 log CFU/cm2 (SE8) at 25°C, and from 1.18 log CFU/cm2 (SE3) to 1.98 log CFU/cm2 at 37°C. Adhesion ability rest of tested isolates on glass surfaces was ranged from 3.64 log log CFU/cm2 (SE10) to 7.0 log CFU/cm2 (SE15) at 25°C, and from 3.06 log CFU/cm2 (SE10) to 4.48 log CFU/cm2 (SE7) at 37°C. Adhesion ability rest of tested isolates on stainless steel surfaces were ranged from 3.74 log CFU/cm2 (SE10) to 7.36 log CFU/cm2 (SE15) at 25°C, and from 3.04 log CFU/cm2 (SE10) to 4.75 log CFU/cm2 (SE7) at 37°C. Incubation temperature of 25°C ($p < 0.05$), with the exception of SE3 ($p > 0.05$), was more favorable to this ability. In contrast to the influence of temperature, tested isolates exhibited a greater propensity to adhere to stainless surfaces, but statistically significant differences were not found.

Within this research, the ability of SE isolates to colonize surfaces was demonstrated, particularly at ambient temperatures, which are common in food processing facilities. Therefore, future investigation should be based on establishing their prevention and eradication and as well as discovery of new biofilm control strategies.

Keywords: Salmonella Enteritidis, biofilm, glass surfaces, stainless surfaces

Food Poisoning and Food-borne Infections

Oral Presentation

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National Salmonella Monitoring Program

Oral Presentation

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MOFAL General Directorate of Food and Control, Turkey

In this scope of Law on Veterinary Services Plant Health food and Feed numbered 5996, monitoring of Salmonella agents that are singnificant for human health 'The Regulation on the Control of Salmonella and Other Identified Foodborne Zoonotic Agents prepared in compliance with the EU legislation and was published in the Official Gazette dated 27 March 2014 and numbered 28954.

According to the legislation in order to decrease and to take control Salmonella agents that are significant for human health at the primary production phase to be established National Salmonella Control Programme.

The basic approach of National Salmonella Control Programmes applied in the world countries, is primarily determining the Salmonella frequency in the production stage and then appyling Salmonella reduction programme based on the production type and the obtained datas.

Also in our country based on the poultry production type, National Salmonella Control Programme was published in order to decrease and to take control Salmonella agents that are significant for human health at the primary production phase for to provide keeping the freguency of S.Enteritidis and S.Typhimurium below the level of 1% in broilers, laying hens and turkeys production. For this reason it is essential that to control of environment, disinfection mechanism and inter-production period are the basic factors in the establishments.

The control rules and taken measures that are mentioned in National Salmonella Control Programme shall be applied by the operators who put into practice the National Salmonella Control Programme in the establishments. It is concluded that applying of National Salmonella Control Programme, will be beneficial to protect public and animal health, to decrease of Salmonella frequency on the foodborne infections also to increase exporting activities.

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The Role of Packaging in Reducing Food Loss and Food Waste

Oral Presentation

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Due to constant growth of world's population, problems with food supply and nutritional deficiencies have increased significantly. While the fight against hunger is on the rise by international organizations; increased consumptionandlimited production affect the ecosystem and the food crisis.The solutions to this issue have gained international priority. Food waste and food loss, which can occur at every stage of the supply chain for different reasons, pose a threat to environmental, social and economic sustainability. The majority of loss or wasted food is closely related to inadequate technology, transport, packaging and storage conditions that can be encountered at every stage of the supply chain. Another problem with this topic is, although it can be consumed, depending on the expiration date, the amount of food being wasted is quite high. Accurate shelf life determination of foods, improving packaging that reduces food losses offer opportunities to reduce the environmental problems caused by loss and waste. This paper states the dimensions of food loss and waste and contributes to the debate by identifying opportunities to reduce or recover food loss and waste through improved packaging.

Key Words: Food loss; Food waste; Packaging; Packaging systems; Packaging development

Metro Cash & Carry Food Lost and Waste Best Practice

Oral Presentation

Tülay Özel
Metro Cash&Carry Best Practice for Reducing Food Loses and Wastes,Turkey

Through sustainability understanding placed into center of its operations since establishment, Metro attaches importance on prevention of fruit and vegetable wastes and losses with the main idea of preventing loss of products and bringing them back to economy for effective use of existing resources.

25-40 percent of 49 million tons of fruits and vegetables produced in our country today are either lost in production or distribution chain stage,or become waste in sales and consumption stage. According to TÜBİTAK data, 11,6 million tons of product, worth 25 billion, which corresponds to four times of our annual fresh fruit-vegetable export, are incurring loss. Cultural heritages are being lost, taste palette is narrowed, and our animal races extinct due to damages caused to environment and inefficient use of resources. Due to improper fishing, fish species are under threat. Support is needed for potential products that are candidates for geographical indication products.

With awareness that food waste and losses are waste of national resources and in order to create a scientific basis for studies on this matter and to reveal current situation, Metro conducted the first study on "Reducing the Fruit&Vegetable Losses and Wastes in Turkey" in cooperation with TÜBITAK. Measuring loss rates from harvest to exhibition for fruits and vegetables by comparing good and poor condition practices, the study has revealed that product supplied in poor conditions turn into waste nine times higher compared to products supplied in good condition. Study also showed that it is possible to significantly prevent loss of product through good supply chain practices, and that stages with most frequent losses are packing and shipping.

Firstly, by conducting consumption analyzes, Metro acts upon the target of planned production with right quantity, quality and specification. World class practices have been launched related to right pack, packaging and shipment of products without breaking the cold chain. It supports reduction of losses through trainings and guidance provided. For example, 50% food loss has been prevented, thus wasting of 1.200.000 pieces of weeds was avoided through trainings on correct pesticide use, correct harvesting time etc. to 200 local producers, and launching of packaging and technological investments. Producer trainings still continue. Metro has moved forward with its efforts on preventing food loss and waste, has joined forces with leaders and operators of sector's leading restaurants, and launched Metro Food Initiative. Every year during the Restaurant Week, Gastronomy Partner identity draws attention to issue of food waste and loss both in menus of restaurants and in habits of consumers. "Metro Gourmet Box" is launched in Istanbul and Eskişehir in order to ensure that consumers take away the remaining of food they ordered in order to reduce food waste at restaurants, and tips on preventing waste in 5 steps are provided to consumers. With voluntary involvement of restaurants to the project, contribution to reducing food waste increases, and chefs cooperate for drawing attention to the matter at social media channels.

In order to expand the scope of efforts carried out by Metro by taking example, spread it throughout Turkey, and solving food safety problems in a sustainable way, it is crucial that all stakeholders exhibit a common approach.

Each ring of production, procurement, sales and consumption processes has to perform an internal evaluation and take responsibility.

Responsibilities of consumers in "Food Initiative" part of this study should be taken into account more comprehensively. It is important to carry out information campaigns to ensure that consumers buy right quantity of product according to their need without causing any loss and waste, and to raise awareness about storage and usage conditions at home after buying the product.

Keywords: food safety practices,food loss, food waste

Food Loss and Waste Accounting and Reporting Standard

Oral Presentation

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Ülkemizde 5996 sayılı Veteriner Hizmetleri Bitki Sağlığı Gıda ve Yem Kanunu kapsamında halk sağlığı önemi olan gıda kaynaklı *Salmonella* etkenlerinin izlenmesi amacıyla Avrupa Birliği (AB) mevzuatına uyumlu '*Salmonella* ve Belirlenmiş Diğer Gıda Kaynaklı Zoonotik Etkenlerin Kontrol Altına Alınması Yönetmeliği' 27 Mart 2014 tarih ve 28954 sayılı Resmi Gazete'de yayımlanmıştır.

Yönetmelik gereği, halk sağlığı önemi olan *Salmonella* serotiplerinin birincil üretimde azaltılması ve kontrol altına alınması amacıyla 'Ulusal *Salmonella* Kontrol Programı' hazırlanmıştır.

Dünya ülkelerinde 'Ulusal *Salmonella* Kontrol Programları'nda temel yaklaşım, öncelikle üretim aşamasında *Salmonella* sıklığının belirlenmesi ile, elde edilen verilere ve üretim şekline göre *Salmonella* azaltma programının uygulanmasıdır.

Ülkemizde de kanatlı üretiminin yapısına bağlı olarak *Salmonella* sıklığının belirlenmesi ve işletmelerde halk sağlığı önemi olan *Salmonella* serotiplerinin birincil üretimde azaltılması ve kontrol altına alınması amacıyla 'Ulusal *Salmonella* Kontrol Programı' yayımlanmış olup, kontrol programında hedef; broyler, yumurtacı tavuklar ve hindilerde *S*.Enteritidis ve *S*.Typhimurium sıklığının %1 düzeyinin altında olmasının sağlanmasıdır. Bu amaçla işletmelerde çevre kontrolü, dezenfeksiyon ve üretim dönem arası sıklığı, kontrol edilmesi gereken temel faktörler olarak önem taşımaktadır.

'Ulusal *Salmonella* Kontrol Programı'na dahil olmak isteyen işletmelerin, kontrol programında yer alan tedbirlere uyması gerekmektedir. 'Ulusal *Salmonella* Kontrol Programı'nın uygulanması, gıda kaynaklı *Salmonella* enfeksiyonu görülme insidansının düşürülmesi ve başta insan ve hayvan sağlığının korunması ile, kanatlı sektöründeki ihracat artışı ve ticari faaliyetlerin daha geniş yelpazede sürdürülmesinde olumlu etkiler sağlayacaktır.

Kaizen Practices in Chewing Gum Production

Oral Presentation

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The story of Kaizen miracle started with Sakichi Toyoda, founder of Toyota, implementing quality circles leading to the development of the "Toyota Production System" in 1950. In 1986, Masaaki Imai introduced to the Western World the Japanese term Kaizen and made it famous through his book, "Kaizen: The Key of Japan's Competitive Achievement". Kaizen means change to better in Japanese. This understanding requires a way to take everything forward. This necessitates two important principles: reducing losses and revealing problems instead of hiding them. In this respect, there is always loss prevention and problem hunting in a workplace that has gone through total quality management. Techniques developed to solve the problem have an important place in the KAIZEN philosophy (Masaaki, 1994).

Today, even if automation is used in industrial production of food, raw materials, semi-finished products and final product losses can be experienced in lines caused by old production lines, the improvement needs of time, and some wrong personnel practices. Moreover, due to shelf life, the preference of the raw materials as powder generally prevents the use of closed systems, which can lead to pouring, risk of contamination or airborne losses. Kaizen philosophy aims to eliminate losses with the continuous improvements in equipment, labor, material and energy use. Apart from that, it also covers improvements of environment, the health, safety and office processes of employees. At the heart of Kaizen's work is the constant, small improvements that are made especially by the workers. Continuous improvement is a management system that prioritizes the process, supporting people's process-oriented efforts. This can only be achieved through the training of workers are working in production. Perfetti van Melle continuously educates all personnel working in production on Kaizen practice principles and evaluates Kaizen applications that have reached success in the internal rewarding system, thus increasing employee contribution and continuity.

With Perfetti van Melle's in-house software system, all Kaizen ideas can be evaluated and archived on this system. All stages of Kaizen applications are recorded in the system with a photograph. It is a big step forward in this system to spread an Kaizen application that is successful on one line to all other lines quickly.

The main sources losses of gum raw materials formed in the lines are;
• Taking out or not using back chewing gum during metal and weight control,
• Gum, syrup and raw material residues formed in the walls of mixer, boiler and extruder, • The need for elimination of some machine failures, especially when the line is being operated,
• Not to make technical improvements on time,
• Pouring in production and weighing areas,
• Late detection of problems during production.

Average of 108 Kaizen in a year are being undertaken that provides to reduce loss and positive returns for the company as financial and labor power caused by the above-mentioned

main reasons. Looking at their profit points, it can be seen that there is usually efficiency in lines, material gain and decrease in labor force and production period. It can also be considered that these studies also provide a financial gain as they are carried out with in-house training rather than purchasing external services.

As a result of this review, the presentations to be presented at the congress will focus on numerical values, annual average Kaizen numbers, their numerical returns, and personnel training periods. Kaizens are derived maximum profit will be presented with photo pre-post impressions and explained with the outlines of these applications which can be an example to other sector companies.

Keywords: Food recovery and waste reduction, Kaizen, Chewing gum production, Chewing gum recovery

Poultry Meat Sector and Food Safety Practices

Oral Presentation

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Poultry meat; is one of the important animal protein source to consume in order to achieve healthy and balanced diet and physical and mental development.

Poultry Sector in Turkey has the quality system which can continuously supply top quality production and this systems sustainability has been constituted from various national and international disciplines quality. Poultry businesses are under continuous audits from government, private sector and international audit institutions. Poultry sector is a sector which is frequently audited by Food, Agriculture and Husbandry Ministry.

Poultry Production; the primary priority and the common purpose of all of the companies in all of the production steps of the poultry production is; to protect consumer health. All of the companies in the poultry production sector are working with integration model.

Beypiliç has been producing quality and safe products from setting of the foundation of quality and food safety management systems as means of institutionalization in 1999 till now and still continues to do so. Beypiliç has all of the certifications regarding with quality and food safety. Most of the companies in the sector also have most of the certificates.

Practices regarding with the GFSI (Global Food Safety Initiative) approved and internationally accepted standards of BRC, IFS and FSSC 22000 has benefitted our company in many ways. Why are

Relationship between Food and Health/Disease from Endocrinology Point of View

Oral Presentation

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Antibiotic Residues in Foods and Their Effects on Microbiota

Oral Presentation

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Food Processing Techniques from Human Health Perspective

Oral Presentation

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There are many processing techniques with the aim of preparing and preserving food. Drying, fementation, preservation with salt, preservation with sugar,smoking are quite old. They are fallowed by canning and freezing Recently, we are investigating alternative methods such as impulsed electrical field, high hydrostatic pressure, ohmic heating, etc.

There are negative aspects as well as positive aspects of food processing methods. However, more negative aspects of these processes are being discussed. These are the loss of nutrients and the formation of harmful compounds.
(1)Loss of nutrients occurs especially during grinding of wheat and bleaching of rice. These processes lead to loss of nutrients especially dietary fiber, group B vitamins and minerals from wheats and paddies. This phenomenon is one of the main causes of nutrition defficiency in the world
(2) During heat treatment (pasteurization, sterilization, etc.), the loss of vitamins (especially vitamin C) and amino acids is occurring. This loss also applies to home cooking.
(3) Harmful compounds can be formed in foods subjected to excessive heat treatment.The main ones are hydroxymethylfurfural (HMF), acrylamide AA), polycyclicaromatic hydrocarbons (PAH).These compounds are considered as carsinogenic.

(4) In addition, soma harmfull compounds such as epoxy fatty acid (EFA) during frying and monochloro-propanediol (MCPD) and glycidol ester (GE) during refining of oils at very high temperature can be formed.
Studies on the level of these compounds in foods are still going on. On the other hand, process improvement and alternative process development studies are continuing to reduce the amount of these.
While the negative aspects of food processing are exaggerated, it seems that the positive aspects are overlooked. This can even lead to the idea that food procesing is not necessary.For this reason,the positive aspects of the food processes need to be reminded time to time:
(1)The shelf life of foods after the harvesting, milking, or slaughtering is very limited. Their shelf life can be extended with an appropriate method of preservation. This prevents food wastage and contributes to food security.

(2) The production of most plant foods is limited to a certain region and a certain season. The preservation method is used to ensure the availability of food every season and everywhere. So it helps to get a balanced diet.
(3) Foodborne poisoning is mostly caused by raw foods. The main cause is pathogenic bacteria. Many foods are suitable nutrient medium for the growth of molds and forming mycotoxins Pathogens can only be inactivated by heat treatment and mold growth can be prevented by an appropriate preservation method. Therefore, food processing is a very important tool in ensuring food safety.
(4) The use of pesticides, hormones, antibiotics, etc. in agricultural production is

widespread. The residues of these are also an important food safety issue. For this reason, it is necessary to control residues in the raw material with appropriate tests. It is not the case that these control tests are applied at home scale.

(1) (5) Heat treatments applied to foods increase the digestibility and bioavailability of large molecules such as starch, protein, pigment, etc. Thus the nutritional value of foods is increased.

(6) In terms of consumption, the sensory qualities of food such as taste, smell, color and texture are also important. These factors primarily determine the consumer's choice of food. The own sensory characteristics of many foods is formed during the procesing. Tea and bagel are typical examples of this.

(7) Ready foods also provide ease of supply, storage, preparation and dosing in the kitchen, thus improve the quality of life

Relationship between Residues in Animal Products, Human Health and Disease

Oral Presentation

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In animals, the usage of risky drugs to human health when they present in animal foods, such as meat, milk, egg and honey, is prohibited. Drugs, permitted for use in food animals, are subjected to a very strict residue and safety assessment due to adverse effectsthat can be reflected in human health. For this situation, the path followed in our countryis similar to the European Union (EU). Maximum residue limit (MRL) is defined as the permitted amount of drugs that are allowed to be used in food animals, in animal products. After applied drugs to the animal are expected to fall to the MRL levels in the animal's edible products, these products are allowed to be served.It is assumed that veterinary drug residues will not pose a risk to human health, when consumed at a lower level than MRL in animal products. According to European Union harmonization laws, pharmacologically active substance residues in animal products are subjected to annual controls to determine whether they exceed the MRL level. 519 substances (mostly plant extracts) which are evaluated for the use in food animals, are considered highly safe in terms of human health and it is not even necessary to specify MRL for these substances.The number of drug molecules that have passed the safety assessment and allowed to be used in food animals is rather low (167 units). There are 10 substances are never allowed to be found in foods. Including these 10 substances, there are 82 substances are not allowed to be used in food animals as a result of safety assessment. A drug that is allowed in a food animal species may be prohibited in another species, or even a drug may be allowed or prohibited in the same animal species.

In addition to prohibiting the use of drugs which poses a risk for human health when they present in foods, the European Food Safety Authority has taken the approach of a reference point for action for these banned drugs, in the Panel on Contaminants in the Food Chain (CONTAM), 2013. Accordingly, it has been aimed to increase the sensitivity of the analytical method used between the union countries and to ensure equality in practice, in terms of control of prohibited substances. Therefore, the higher quantities of prohibited substances identified in the animal's offal tissues or fluids (hair, urine, etc.) than the daily consumption is accepted as a reference point for action. In this way, it is aimed to prevent both consumption and trade of products that exceed this point of action among the union countries.

Antibiotics and antiparasitic drugs are the most commonly used medicines for treatment and prevention of common diseases in food animals. Antibiotics are used only for therapeutic purposes (not used for productive purposes) and with veterinary prescription. The effects of antibiotic residues in animal foods, due to use of these drugs in animals, on the intestinal flora in people consuming these foods, are also examined under safety assessment. The other potential risk of antibiotic use is the possibility of antibiotic resistance in zoonotic bacteria. The screening of antibiotic resistance in zoonotic infectious agents that pass to humans from animals due to use of antibiotics in animals, is a requirement of EU harmonization laws.

In this presentation, it will be tried to examine the practice differences between our country and European Union, in order to manage the possible negative effects of drugs or other undesirable substance residues on human health, in animal products.

The Proficiency Testing Service of MoFAL National Food Reference Laboratory and General Evaluation

Oral Presentation

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Proficiency Testing (PT) is defined as evaluation of participant performance against pre-established criteria by means of interlaboratory comparisons. PT provides the quality assurance of laboratory test results as an external quality control tool, also, encourages the objective evaluation of analysis and the technical development of the studies, and allows feedbacks. National Food Reference Laboratory (NFRL), which is affiliated to the Ministry of Food, Agriculture and Livestock (MoFAL), organizes PTs on the basis of the provision of the article 5, paragraph 2, subparagraph b, of the heading "Laboratory Formation and the Main Tasks" of the "Regulation on the Establishment and Duties of the National Food Reference Laboratory Directorate".

'TS EN ISO / IEC 17043 Conformity Assessment - General Requirements for Proficiency Testing' is an international standard that sets out all the technical and administrative aspects of organizing PTs. All PTs organized by NFRL are implemented in accordance with this standard. International standards (ISO 13528, IUPAC protocol) and statistical methods (Huber H15, Q/Hampel etc.) are used in evaluating the results of PTs.

When all PTs are inspected on the basis of field of interest by the end of 2017, it is seen that 25 Microbiology PTs with 346 participants, 10 Pesticide PTs with 242 participants, 7 Mycotoxin PTs with 329 participants, 4 Elemental Analysis PTs with 167 participants, 6 Histology PTs with 41 participants and 3 GMO PTs with 48 participants have been organized. Besides, when all PTs are inspected on the basis of matrices; microbiologic analysis of E.coli O157, Listeria monocytogenes, Salmonella spp., Cronobacter spp., Stafilococal enterotoxins in foods and ready-to-eat foods, residue analysis of pesticides in fruits, vegetables and cereals, residue analysis of naphthalene in honey, mycotoxin analysis of Aflatoxin B1 and total Aflatoxins and Ochratoxin A in dried fruits (dried figs, dried vine fruit), mycotoxin analysis of Aflatoxin B1 and total Aflatoxins in hard-shelled fruits (hazelnut, pistachio) and spices (chili powder), elemental analysis of Lead (Pb), Cadmium (Cd), Arsenic (As), Tin (Sn) in food, elemental analysis of Copper (Cu), Zinc (Zn) in feed, histological analysis of different tissue (bone, cartilage and offal) in meat and meat product preparations, GMO analysis of different GMOs in cereals have been prepared. It is also seen that general success rates are high for each PT. The number and diversity of PTs, which were first initiated with GMO PTs in 2010, are increasing every year. An accreditation application has been made for the PT service which is carried out in accordance with TS EN ISO / IEC 17043, and the process is in progress. Priority in the planning of PT program is given to the issues that are of agronomic and economic importance for our country and the requests from participants. PTs organized by NFRL also serve as an audit mechanism on behalf of Ministry. NFRL requests for corrective/preventive action on nonconformity from participants who do not receive appropriate results, evaluates the conformity and adequacy of the activity, and provides feedbacks to the Ministry. In all conditions, all information about participants are

confidential. Considering prices, PTs organized by NFRL offer a significant price advantage over other PTs imported from abroad for external quality control purposes.
Keywords: analysis, external quality control, food and feed, laboratory, proficiency test

Glycidol Ester (GE) - 3-MCPD Risk in Food and Mitigation Methods

Oral Presentation

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Recently, food contaminants in terms of food safety have been an important topic of research for consumers and producers. The recent studies on food contaminants are becoming of more vital importance in terms of food safety and public health. In recent years, glycidol esters and 3-monochloropropane 1,2-diol (3-MCPD) have become a common area of research and their structure, formation, factors affecting their presence in foods, analysis methods, toxicology, health effects and risk factors have begun to be examined extensively. Glycidol esters (GE) and 3-monochloropropane 1,2-diol (3-MCPD) are known to be process contaminants. 3- MCPD food contaminant was initially identified as toxic component that was formed as a result of a reaction of phospholipids, acylglycerols, and glycerol with hydrochloric acid in hydrolyzed vegetable proteins (HVP) in a study carried out by Velisek et al. (1978). When the international literature is analysed, the studies have revealed that 3-MCPD and glycidol esters are found primarily in processed foods such as acid hydrolysed vegetable protein and soy sauce, refined vegetable oils and fats, smoked foods such as meat and fish, potato products, chips and snacks, baby food, malt, cereals, fruits and vegetables, soups, biscuits and bakery products, milk and dairy products, and alcoholic beverages. Studies conducted at national level on 3-MCPD and GE in products put on sale in Turkey have been insufficient in terms of food safety and process safety. In one of the current studies, Özdikicierler and Yemişçioğlu (2016) have found the effect of deodorization conditions in the formation of 3-MCPD and GE with the response surface methodology. In another study, Önal and Yemişçioğlu (2016) discussed 3-MCPD and GE formation process in potato chips via a model system. In studies conducted, it has been reported that 3-MCPD is formed in processed foods as a result of primary reactions in the formation of lipid and chloride. This reaction comes out when the foods that have high oil and salt contents are processed at high heat treatment conditions (Karabulut and Yemişçioğlu, 2013; Chung et al., 2013). In 1996, the UK Food Committee stated that 3-MCPD levels in food and food products should be brought to minimum levels. Additionally, the UK Food Committee has made suggestions for improving the production conditions with regard to reducing food product levels. As a result of the studies carried out on the subject, in 2000 the UK Food Committee reported it as a carcinogen and a food borne contaminant with a potential genotoxic effect. Due to the potential genotoxic and carcinogenic effects of 3-MCPD, many studies have indicated the necessity of setting limits for the 3- MCPD substance in the relevant food products. Recent studies have emphasized that the main factor in the formation of 3-MCPD is the effect of process conditions (temperature and time) as well as the presence of Cl "ion, monoglyceride and diglycerides (Karabulut and Yemişçioğlu, 2012). Most of the studies that have been carried out until now indicate the fact that 3-MCPD and GE are formed when the vegetable oils are exposed to high temperature applications, especially when the deodorization process reaches up to 230 ° C depending on the type of oil being processed

and chlorine ion is present in the environment. This study focuses on food safety risk and the elimination methods of this risk in products that contain refined oil and are subjected to heating by the addition of salt. The notice will also discuss the points to be considered in refining palm oil and its fractions, the risks in other refined vegetable oils and the situation in food products such as potato chips, snacks, and bakery products.
Keywords: Food Safety, 3-MCPD, Glycidol ester

Nanoclay Based Active food Packaging with Antibacterial, Ethylene Scavenging and Gas Barrier Properties

Oral Presentation

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Nanotechnology offers new approaches in the design of food packaging materials that can improve the quality and shelf life of food products. Active food packaging materials can interact with food through active agents that are incorporated into them and interfere with processes that lead to spoiling. Nanocomposite films prepared by incorporating clay nanoparticles into polyethylene matrices will be presented as active food packaging films with antibacterial, ethylene scavenging and gas barrier properties. Clay nanoparticles loaded with antibacterial agents are coated onto the surface of food packaging films as a nanocoating by Layer-by-Layer assembly. Resulting films reduced the viability of a food

pathogen, Aeromonas hydrophila by 85% and the aerobic count
on chicken surfaces by 48%.
When clay nanoparticles are homogeneously dispersed in the polyethylene matrix they acted as scavengers of ethylene gas, the gas responsible for spoiling of fruits and vegetables. Prepared films were shown to slow down the ripening process of bananas and retain the firmness of tomatoes due to their ethylene scavenging properties. Clay nanoparticles dispersed in the polyethylene matrix also reduced the oxygen and water vapor transmission rates of films. When packaged with prepared nanocomposite films strawberries presented slower weight loss than strawberries packaged with neat polyethylene films due to their water vapor barrier properties. Similarly, chicken surfaces packaged with nanocomposite films demonstrated less aerobic bacterial growth compared to chicken surfaces packaged with neat polyethylene films due to their oxygen barrier properties. Nanoclay/Polyethylene nanocomposite films demonstrated in this work can greatly contribute to food safety as active food packaging materials that can improve the quality and shelf life of food products.

Keywords: antibacterial food packaging, ethylene scavenging food packaging, barrier food packaging, nano clay, active food packaging

Utilization of Nanomaterials in Detection of Food Contaminants

Oral Presentation

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Nanometer scaled materials has been frequently used in the development of novel analysis methods due to their high surface area/volume ratios and size dependent electrical and optical properties. Especially, nanotubes and nanoparticles enable the development of new strategies to achieve high sensitivity, stability and selectivity in bioassay and biosensor systems. Recent developments in nanotechnology applications have aroused interest in the field of food as well as in many different areas, and the research has focused on the use of these applications in the maintenance of food safety. Rapid, reliable and sensitive detection of microbiological and chemical contaminants in food plays critical role in the prevention of foodborne illnesses. Advanced laboratory equipment and specialized staff are required for the analysis of various food contaminants. For this reason only limited number of samples can be analyzed. Hence, development of novel methods is an urgent requirement for food analysis. Novel nanomaterial based methods have the feature of high sensitivity as well as ease of use and in-situ detection. In these methods, nanomaterials are used as catalytic agents, platforms for the immobilization of recognizing agent, optical or electroactive labels. By coupling different biological recognition molecules such as enzymes, antibodies or aptamers with nanomaterials, it is possible to detect important agents of foodborne diseases such as pathogenic bacteria, viruses and toxins. Nanomaterials significantly enhance the performance of electrochemical biosensors. Due to the optical properties of semiconductor nanoparticles, sensitive and multiplex detection of food contaminants can be achieved by fluorometric analysis. Besides, it is possible to carry out in-situ analysis by paper based methods in which nanoparticles are used. New strategies can be developed in terms of quality control and traceability in the food industry by these bioassays.

The development of sensitive, reliable, inexpensive and portable detection systems by nanomaterial integrated bioassays and biosensors have become a popular research topic. Although the detections of various food contaminants have been successfully performed on model systems, the same success could not be achieved when working with real samples. The variability in the structure of the samples and the reproducibility problems limit the use of these developed systems in food analysis. In order to use these developed methods effectively in real food samples, it is necessary to increase the stability and minimize the interference caused by the real sample. In this respect, although pretreatment steps including the extraction of the target analytes are developed, they prolong the analysis time of the method and obstruct the in-situ detection. By ensuring the automation of analysis method and integrating extraction into the system, an important step about the use of these developed systems in food analysis will be attained. Besides, with the widespread use of these systems, the potential toxicity problem due to the nanomaterials should also be investigated. By removing these obstacles in future studies, it will be possible to use the nanomaterial based detection systems in food analysis.

In our research group, we have developed a novel method for the detection of Escherichia coli in water samples by coupling immunomagnetic separation with semiconductor nanoparticle lebeling (Dudak and Boyacı, 2008). We have also demonstrated the capability of semiconductor nanoparticles in the multiplex detection of bacteria (Dudak ve Boyacı, 2009).

A SERS-based analysis method for the determination of Staphylococcal enterotoxin B was developed using core-shell structured iron-gold magnetic nanoparticles and the performance of the developed system in milk, serum and urine samples was examined (Temur et al., 2012). In addition, a significant enhancement in the analytical sensitivity for target analytes has been demonstrated in the studies where gold nanorods were used as SERS labels (Güven et al., 2014; Torul et al., 2014).

Keywords: Food contaminants, Nanomaterials, Nanoparticles, Biosensors, Bioassays

Anahtar Kelimeler: Gıda bulaşanları, Nanomateryaller, Nanopartiküller, Biyosensörler, Biyoanalizler

Low-cost, Portable, Rapid and Robust Analytical Methods for Food Safety

Oral Presentation

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Safe food is the indispensable necessity of modern society. Due to the extensive public concernments and legal restrictions, it is essential to continuously track the food manufacture and processing, and to get fast and reliable results in order to protect both the consumer and the manufacturer. For these reasons; innovative analytical tools meeting the ASSURED criteria of World Health Organization (WHO) should be considered as a requirement. The ASSURED (affordable, sensitive, specific, user-friendly, rapid and robust, equipment-free and deliverable to end users) criteria was coined for the ideal characteristics of a test that can be used at all levels of the healthcare system. The ASSURED criteria is also very promising for food safety. For continuous tracking of the food manufacture and processing, in-situ tests and immediate decision-making is a crucial point.
In this review, analytical tools meeting the ASSURED criteria will be discussed and compared with the conventional (chromatographic and spectroscopic) methods. Moreover, detailed information will be given about bioassay methods, biosensors, paper-based microfluidics and potential applications of the smartphones. Finally, advantages, disadvantages and current status of these innovative analytical tools and their usage for food safety will be discussed.

Keywords: Food Safety, Bioassay, Biosensors, Paper-based assays, Low-cost

Desing of Smart Electrospun Oxygen Sensors for Food Quality and Safety

Oral Presentation

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Oxygen sensors from intelligent packaging systems can be used to detect the integrity of packaging, to verify the effectiveness of oxygen absorbers, to provide traceability in the food production and consumption chain, and to monitor the quality and safety of packaged food. For this reason, the aim of this work was to design nanofiber based UV-activated visible colourimetric oxygen sensor by electrospinning.

A completely hydrolyzable poly(vinyl alcohol) (PVA) was used for the oxygen sensor design. Oxygen detection solutions, consisting of compounds such as methylene blue, glycerol and titanium dioxide, were prepared for the oxygen sensitive sensor structure. Single needle and coaxial electrospinning methods were used for the production of the sensor. In single needle electrospinning method; the PVA solution prepared at 12% concentration was mixed with the oxygen detection solution. In the case of coaxial electrospinning, oxygen detection solution was used as core solution with a shell solution of 12% PVA. The voltage applied was changed from 17-21 kV and 19-24 kV while the distance between the needle and the collector was in the range of 14-17 cm and 17-21 cm for the single needle and coaxial electrospinning methods. The morphology of the produced nanofibers was determined by imaging using a field emission scanning electron microscope. In order to test the designed sensor, the produced membrane was cut into 2x2 cm and placed in the packaging material. Then the air inside the packaging material was replaced with nitrogen gas. The sensor in the prepared packaging material was activated at 254 nm under UV light. The response of activated sensor was monitored as the time required to change the color of membrane when oxygen was present inside the package.

In the first part of this study, effects of PVA concentration, solvent type and mixture of different solvents (water, acetic acid, ethanol) were studied in order to obtain nanofiber from the fully hydrolyzed PVA polymer (Table 1). SEM results showed that 12% PVA solution prepared in 25:75 acetic acid-water produced the uniform fiber distribution. In the second part of this study, electrospinning of oxygen detection solution and PVA polymer solution was carried out using both single needle and coaxial electrospinning methods. In the coaxial electrospinning method, colorful nanofibrous membrane could not be obtained due to the encapsulation of oxygen detection solution within PVA polymer (Figure 1a). However, blue colored nanofibrous membrane was produced using a single needle electrospinning (Figure 1b). Diameters of the nanofibers produced by a single needle electrospinning varied from 480 to 850 nm. The produced nanofiber membrane was exposed to UV light after it was packaged. Thus, the color of the membrane was returned from blue to white in about 20 seconds. The color remained stable in oxygen free environment (Figure 1c). However, sensor was returned completely to its original color in about 85 seconds when air entered inside of

the food package (Figure 1d). Results showed that the sensor developed could be controlled directly by human eye and have rapid UV light activation and fast oxygen response. These properties of sensor can provide a quick control of product and therefore people can see whether the packaged food has entered the process of disintegration during the shelf life.

The designed oxygen sensor can be used to produce improved food packages which provide the most suitable conditions for food quality and safety in active, intelligent and MAP systems. In this regard, the sensors developed by the electrospinning process may yield new applications in prevention of losses and providing food safety.

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Keywords: intelligent nanofibers, oxygen sensor, electrospinning, intelligent packaging systems

Approaches to Shelf Life Details in Food and Accelerated Shelf Life Method

Oral Presentation

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In our developing world, people's habits change day by day. With the tendency towards the ready-to-eat food sector and the rapid increase of the world population, the production quantity and product variety in the food industry also increased day by day.
The concept of shelf life has come into being because of the immediate sale and consumption of the food produced by this increase in production and product diversity (1). The shelf life of a food can be defined as the time when the food is safe to consume or when it has an acceptable quality for consumers (2). Shelf life of packaged product, quality characteristics under recommended conditions without significant changes, not to harm the health of a form of technological envisaged to pass to be transmitted to the consumer, physical, chemical and microbiological withstand periods (3). They are classified as perishable, perishable and longevity according to their degradability. Rapidly degradable foods are those that can break down considerably within 60 days and lose their nutritional value and their ability to consume. In deteriorating foods, this process ranges from 60 days to 6 months, 6 months longer in long-life foods (4). Environmental factors that determine the shelf life of foods are temperature, relative humidity, light intensity and oxygen partial pressures, compositional factors are pH, water activity, oxidation-reduction potential and microbial charge (8).

The aim of food shelf life assessment is to assess and document the period in where the food product maintains its intended physical, chemical and microbiological quality and properties. Food deterioration can be accelerated by subjecting the food to controlled environments, followed by then quality evaluation and shelf life estimation (5). Short and long term methods are applied in shelf life calculation. The long-term method is to determine changes in typical properties of the same food as a function of time in different or identical packaging under different storage conditions (1). The analyzes that will be the quality criteria for the food should be determined according to the characteristics of the food and the characteristics of the food. Applicable products of this method are products with short shelf life such as pastry, dairy products, meat products and ready meals (5). This method is time-consuming and laborious, but the method by which the most sensitive results are obtained (1). The short-term method is used as an accelerated estimation method. To be able to apply this method, the first thing to be predicted is types of degradation that limit the shelf life of food. In this method, the food is stored at higher temperatures using the Arrhenius correlation or the Q10 approach and the quality change is monitored and the shelf life is estimated at the lower actual temperature (6). The method is particularly preferred because it gives rapid knowledge of pre- shelf life, in addition to microbiological safety during the product development phase (2). Accelerated stability cabinets for estimation method are used. Applicable products of this method are frozen and dried products stored in the refrigerator (5).

A shelf life study should be an objective, methodical tool to determine the reasonable length of a food product without substantial change in quality. A separate study is required for each food product type (7). Short-term accelerated shelf-life studies should be verified by parallel operation with a long-term method. In order to minimize faults, it is necessary to choose the correct factor of deterioration, to make experiments in different storage conditions and to

choose sensitive analysis method for food product. If accurate parameters are determined by the accelerated shelf-life method, long shelf-life runs will be completed in a short time.

Keywords: accelerated shelf life, shelf life, shelf life criteria, shelf life methods

Methods of Determining Adulteration Made in Olive Oil

Oral Presentation

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Olive oil is the only oil obtained from olive tree, Olea europaea L. fruits. Oils which have been extracted using a solvent or modified with natural triglyceride structure by esterification and mixtures with other oils are outside this definition. Natural olive oil: Olive oil is obtained by applying mechanical or physical processes such as washing, decantation, centrifugation and filtration processes in a thermal environment that will not cause any change in the natural qualities of the olive tree fruit. Natural olive oil are the oils that carry the physical, chemical and sensory properties of the products in their category. The oils obtained by using solvents or assistants with chemical or biochemical effects or by reesterification are outside this definition.

Our country has an important place in the production of vegetable oil. We are also an important Mediterranean country in olive oil production, which is especially beneficial for health. The fact that the production of olive oil in our country is limited, the increase in demand by consumers and the high cost of production are the main reasons which increase the economic value of olive oil and which are attracted to the market by being admitted with other vegetable oils.

Adulteration made in olive oil may cause negative effects on health as well as deceiving consumers by economic damages. For this reason, adulteration in olive oil has become an important problem that has to be emphasized especially in recent years.

In recent years, olive oil, which has a high economic value, has come into frequent relation with lower valued vegetable oils. Some oils such as olive oil, milk oil and cocoa oil are expensive and therefore it is aimed to make more profit by mixing them with low cost vegetable oils (soybean, sunflower, canola).The authenticity of products labeled as olive oil is very important both in terms of trade and health.

Determination of oil mixtures made in olive oil is imported to determinate major and minor components.Each oil has its own components. Determination of their presence and their quantities is important to determinate adulterated oils. Chromotographic methods have been developed to detect the major and minor components of fats and oils. Spektroscopic methods are the methods used for short-term analysis of oils. The combined use of analytical and chemometric techniques is necessary to identify the adulteration in olive oil and to conduct quantitative analysis. Researchers who have determined that the NIR and FTIR methods are effective have also emphasized that spectroscopic methods are easier to use because they are generally cheaper, faster, more reliable, and do not require chemicals compared to chromatographic methods (GC and HPLC). Fourier Transform Infrared Spectroscopy (FTIR - ATR), Fourier Transform Near Infrared Spectroscopy (FT - NIR), Stimulated Dispersion Fluorescence Spectroscopy (EX - EM Fluorescence) and finally Synchronous Fluorescence [SYN Fluorescence]), which are advanced molecular spectroscopic methods, 13 C NMR and P-NMR, and Raman spectroscopy techniques are also included in this group. Determination of only sterol contents is not enough when olive oil is adulterated

with fruit oils such as hazelnuts oils. Because the fatty acids and sterol contents of fruit oils are very similar to olive oil. It has been stated that adulteration can be detected by taking advantage of the proportion of free and bound sterols in the determination of 10% and higher rates of hazelnut oil. Detection of vegetable oil mixtures is usually made using fatty acid distributions and
glyceride fractions of the sterol compositions they have.In this study, the adulterations made in olive oils and the methods developed and used for their determination will be disc
Keywords: olive oil, adulteration, methods

Effect of Food Safety Training on Achieving Food Safety Knowledge and Practices in Restaurants in the Emirates of Dubai

Oral Presentation

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This study evaluates the effectiveness of using demonstrations in training sessions to improve food safety knowledge and practices of food handlers. The study also evaluates the current food hygiene practices in Dubai restaurants based on well-established current good practices (cGPs). Participants in this study underwent a six-hour food safety training class based on Dubai Municipality Basic Food Hygiene curriculum. Findings from this study is aim to provide insights into a fairly new but evolving research area in the retail foodservice sector. The outcomes of this study are expected to have national and international implications for the enhancement of food safety education through the use of demonstrations. To the best of the researcher's knowledge, the training–teaching approach proposed here is the first of its kind in the Dubai context and in the UAE in general. We consider this research is particularly timely, in light of the falling food safety standards in restaurants, and the lower food safety knowledge achievement and behavior of food handlers in many countries.

In the international context, the research findings on the efficacy of food safety demonstrations with the infusion of science on food safety achievement and behavior could have important implications. These include the provision of alternative pathways to the transmission of knowledge as well as the narrowing of the knowledge gap in food safety achievement. This could lead to improved attitudes towards food safety and improved good hygiene practices of the employees in food service area and food safety related paths.

On the basis of the above points, this study is conducted the combination of the food safety education plans with demonstration techniques and hands-on activities. Some effective hands- on activities includes microbial test kit ATP, testing sanitizer concentration with chlorine test strip and testing hand hygiene with glo germ. It also identified the frequent examination of the extent to which food safety knowledge and practices have improved following the use of food safety training programs.

The study concludes that training with demonstration techniques is an effective way of improving compliance with food safety guidelines. There is presence of restaurants food safety shortcomings related to time/temperature control
Improper hygiene, cross contamination.The study recommends training in improving food safety knowledge and personal hygiene practices amongst the food handlers.

Keywords: food safety training, food safety knowledge, food safety risk factors, food hygiene practices, demonstration, food handlers

The Human Age: Confronting the Anthropocene Conundrum

Oral Presentation

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The Human Age: Confronting the Anthropocene Conundrum
For most of human existence we survived on current and recent sunshine – water, wind, and wood – to power society. Over the past three centuries we transitioned to stored fossil sunshine – coal, oil, and natural gas – to power our lives, and now rely primarily on this ancient sunlight, the fossilized carbon remains of ancient plants and animals, to turn our wheels and light our world. Fossil fuels have allowed extraordinary expansion of the human enterprise – our food supply, material wealth, and population. In less than seven decades world population tripled from 2.5 billion in 1950 to 7.5 billion in 2017, and we have simultaneously transformed the land, seas, and atmosphere of our finite planet. Scientists call this new human-dominated era The Anthropocene, or "Age of Man." Worrisome trend lines from ongoing fossil fuel use – rising temperatures, extreme weather, melting ice, and rising seas – indicate that humanity's continued prosperity is at risk as wild habitats and species vanish, pollution accumulates, and the planet heats up from the effluent of our aspirations. We approach a turning point: What will it take to create a soft landing for civilization now? Can ingenuity, wisdom, and those same fossil fuels build a bridge to a sustainable low-carbon energy future powered again primarily by renewable current sunlight? Our future likely depends on the success of this transition.

Climate Change and Sustainability in Agriculture in Turkey

Oral Presentation

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Climate Change and its Effects on Food Safety

Oral Presentation

Mary Kenny
UN Food and Agriculture Organization (FAO),Italy

Food safety authorities need to work continuously to address a range of critical food safety and quality issues. Despite being well understood critical food safety issues, microbiological or chemical in nature, still present challenges in many contexts. Food safety hazards can arise at any stage of the food chain from primary production through to consumption, and risk-based approach in food safety management are important. Being cognizant of emerging food safety issues is also an integral responsibility of food safety authorities to ensure a robust food control system, and ensure that efforts are focused on issues that pose the greatest risk.

It is likely that climate change will have negative consequences for food safety ranging from changes in the environment (environmental contaminants), changing profiles of pathogens (both human and animal diseases), increased contamination from mycotoxins and marine biotoxins, as well as the increased hygiene risks leading to an increased burden of unsafe food. Extreme weather events linked to climate change require improved capacities for food safety emergency preparedness. Assuring food safety requires the active involvement of a number of stakeholders from the public and private sectors. The adaptation of food safety strategies to a changing climate should be based on evidence, therefore there is a need for more research and data sharing as we look at changing patterns and emerging food safety risks. FAO has a key role in assisting developing countries to assess the changes to their food safety situations and to promote international cooperation in improving the understanding of food safety implications of climate change. The FAO Strategy on Climate Change endorsed in 2017, refers to the most relevant food safety considerations in climate change adaptation and mitigation.

The presentation will discuss the more likely changes in hazards and look at climate change as it relates to food and agriculture. FAO work and initiatives will be covered at global and regional level, and ongoing work to better address any emerging risks due to climate change.

Food Safety Studies of Turkish Ministry of Food, Agriculture and Livestock and Interpretations

Oral Presentation

Neslihan Alper
Ministry of Food Agriculture and Livestock, Turkey

The most important and essential need of communities is the safe food supply. Everywhere in the world, individuals need to be able to provide adequate amounts of safe food for a healthy lifestyle by providing their biological growth, physiological and mental development. Food that is suitable for consumption and has not lost its nutritional value is defined as "Safe Food", which is not a cause for any health problems from any factors causing deterioration and disease.

In this context, food safety and public health are a strategic priority for our country as well as for all countries. In addition to the human suffering caused by foodborne illnesses, as well as the financial burden of labor and treatment costs imposed by the national economy, problems arising in tourism, cultural cohesion and similar socio-economic aspects should not be overlooked.

ISO 22000, Good Hygiene Practices (GHP), Good Manufacturing Practices (GMP) are priority approaches adopted in the international arena for food safety, based on hazard analysis and critical control points. These approaches are also adapted to official controls of our Ministry.

Providing sustainable and effective food inspections with the concept of "Food Safety From Farm to Table" in the framework of the legislation prepared in accordance with the Codex Alimentarius and the European Union acquis is the basic food safety approach of our Ministry to supply food safety and prevent unfair competition in the sector.

Providing "food traceability" from primary production in the food chain to farm to table to ensure safe food supply, risk-based official controls are carried out by the Ministry according to the Law no. 5996 on the Veterinary Services, Plant Health, Food and Feed.

Official controls are carried out at the appropriate frequency and without prior notice to the operations (except HACCP audit) in proportion to the risk of food contamination. Results of official controls of food establishments and relevant assessments data are put daily in the Food Safety Information System (GGBS). Every year, increasing number of required audits should be removed from being an indicator, instead, concepts such as HACCP and ISO 22000 based effective controls and areas of cooperation with the sector should be introduced.

Within the scope of the EU-funded food safety project already carried out, efforts are being made to strengthen food and feed safety and control services. This includes the preparation of the Multi-Annual Control Plan, sector-based implementation of audit procedures (different audit guidelines for different sectors), and training of food official controllers on sector-based EU implementations, and laboratory training.

There are three pillars of work to ensure food safety. The first base is the official control, but the manufacturers and consumer sector organizations are the other bases. In this context; it is of utmost importance that the consciousness of producing and consuming of safe food is adopted by all sections of the society.

Minimisation of Acrylamide Formation in Food Processing in the Light of New EU Regulations

Oral Presentation

Vural Gökmen
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Detection of acrylamide levels in processed foods has been an intensive area of research shortly after the discovery of acrylamide in heated foods by the Swedish researchers in April 2002. Several researchers have established that the main pathway of acrylamide formation in foods is linked to the Maillard reaction and, in particular, the amino acid asparagine. Thermally processed foods encompass a vast range of different products with many ingredients, processes, recipes and scales of operation. The resulting acrylamide concentrations in these foods change with great deviations as influenced by product composition and thermal processing conditions.

Basic facts on the mechanism of acrylamide formation and factors affecting its concentration in thermally processed foods are overviewed in this presentation. Current EU regulation on mitigation measures and benchmark values and recent research findings for mitigation of acrylamide by means of recipe and process modifications are also discussed.

GMO Rules and Principal Differences between Turkey and EU in Regard to Implementation of These Rules

Oral Presentation

Hakan Yardımcı
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Turkey has established a law paralleled to Cartagena Biosafety Protocol and EU directives by noticing necessities of the country about GMO issue. Biosafety Law and two regulations came into effect on 26th September 2010. In this law, Genetically Modified Organisms (GMO) and Genetically Modified Microorganism (GMM) were identified as a living organism, with the exception of human beings, obtained by transferring gene through the use of modern biotechnological methods, and microorganisms in which the genetic structure has been altered in a way or process that is out of the natural recombination, respectively. The objective of this law is to establish procedures and principles in relation to prevent the risks that may be due to genetically modified organisms (GMO) and its products (GMOP) obtained through the use of modern biotechnology within scientific and technological progresses; to be established and implemented biosafety system with the aims of conservation and ensuring sustainability on human, animal and plant health with environment and biological diversity; and, to be reviewed, set out and monitored these operations. This Law contains the provisions regarding research, development, processing, place on the market, monitoring, using, importation, exportation, handling, transportation, keeping, packaging, labelling, storage and similar operations in relation to genetically modified organisms and its products (GMO and GMOPs). Veterinarian medicinal products and medicinal products for human use and cosmetic products which are permitted or certified by the Ministry of Health are out of this Law's scope. Despite being prepared in the EU harmonization process, the Biosafety Law shows significant differences in some issues with the legislation and practices of the European Union in the same subject. Turkey is not yet members of the European Union, has no importance for Turkey of EU decisions or EFSA report on GMOs. The application process for GMOs in Turkey, assessing risk, and the label threshold considered after applications such as contamination, is likewise apply the rules of the European Union. Prohibition of GMO production, non-use of GMOs in baby foods and imprisonment are the biggest differences with the EU. In the European Union, a decision is made by the European Commission regarding GMOs that have undergone risk assessment by EFSA and received positive reports. In Turkey, the Biosafety Board decides about the risks and socio-economic assessment made GMOs in the scientific community. Positive decisions taken by the biosafety committee are implemented by the relevant ministry after it is promulgate. GMO applications to the European Union are made by the companies with the gene, and any information (including confidential information) on product commercialization is given to EFSA. There are differences between the EU and Turkey on the appeal. The application of GMOs in Turkey, and the decision is taken separately for each purpose. However, in the European Union, there is only one appeal and only one decision is taken for food and feed. According to this, GMO, which is allowed in the EU, can be used both as food and feed. In addition, gene firms did not have GMO appeal in Turkey until today, because of the Biosafety Law rigid. For that reason, the GMO applications were not made by the importing companies for the Biosafety Board and the information that the Scientific Committees requested from the importer for risk assessment purposes could not be given to the third

parties by the producer firms. Appeals made to the Biosafety Board about food were withdrawn by applicants. The use of GMOs in food is prohibited by the fact that there is no consensus. As in the European Union, food and feed have a labeling threshold of 0.9% and a contamination threshold of 0%. In the application for feed, 9 soybean and 26 corn were accepted. The labeling threshold is 0,9% and the contamination threshold is 0,1% as it is in the European Union (for GMOs applying but not yet accepted). Today, 36 GMOs for feed (10 soybean and 26 corn) has approved in Turkey. Thereagainst, 102 GMOs (19 soybean, 65 corn, 12 cotton, 5 rape and 1 sugar beet) approved for food and feed in the European Union . There is no GMOs have been authorized for food in Turkey. However, in the EU this number is 102. Therefore, the EU's zero tolerance policy in GMO contamination on food, compared with Turkey applies very comfortable. In addition, because of the only decision taken for food and feed, allows low-level contamination to be tolerated.

Endocrine Disrupters in Food from Animal Origin: Identifying Risks at Sources of Exposure

Oral Presentation

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Endocrine disrupting compounds (EDCs), as naturally occurring or man-made substances, mimic or interfere with the function of hormones. Growing concerns are related to the adverse effects on reproductive, development, neurological, cardiovascular, metabolic and immune systems in both human and animals as well as environmental effects. Among EDCs; organochlorine pesticides, dioxins and dioxin-like polychlorinated biphenyls (PCBs), bisphenol A, styrene, phthalates, organotins and nonylphenol are considered as high priority due to their persistence. As EDCs are mostly lipophilic; they are found in food from animal origin (FFAO) such as milk and dairy products, eggs, meat etc. In order to develop action plans to address priority for EDCs related to the risks from FFAO, risk assessment though globally accepted farm to fork approach should be considered including detailed evaluation of the contamination from the stages of feed, breeding, slaughter, processing, packaging and storage/distribution. Contamination from feed include sources by natural origin; such as phyto-mycoestrogens (zearalenone, genistein, coumestrol) and goitrogenic glucosinolates; sources by storage, transport and processing (inadequate cleaning) and inadvertent means (malpractice especially in waste management- dioxin and furans). Regarding breeding; contraversing studies reveal the differences in the concentrations of EDCs in free-range and organic farms compared to conventional/entansive breeding as the edible sources and environment (landfill fires, packyard burnings increase the emission of PCDD/Fs) are affected. We have previously presented free range/organic eggs contained higher levels of PCB and organochlorine compound residues as well as diethylphthalate; while dimethylphthalate was found almost in all eggs. Dairy products show more variability since large seasonal variations occur in the fat content; and various factors effect the carry over of these compounds through absorption (lipophilicity, source), metabolism, storage. Contamination during process include food conditioning, heating, packaging steps. Milking units (claws, tubes, chambers made from plastic materials) are also considered as a source for phthalate contamination. Among processing; meat/cheese smoking are important in terms of PAH contamination where time and temperature of the smoking process and design of the processing plant directly effects the risk. Packaging sources include food contact materials (FCMs) leading migration of EDCs dependent of the temperature, storage/contact time, physicochemical properties, packaging size. Examples include phthalates from various polymers (polyethylene plastics in milk bottles; high density PE, low density PE), styrenes in packaging yoghurt, cheese, milk and eggs. We have shown the presence of phthalate residues in different types of yoghurt; where the results reveal 88.5% was contaminated with two or more phthalates. In order to slow the onset of oxidative degradation of plastics, addition of antioxidants (arylamines, butylated hydroxytoluene,

BisphenolA), to prevent thermal degredation addition of heat stabilizers (PVC, PVDC), reduce the friction of surface addition of slip agents (waxes) are also potential sources for EDCs. Meanwhile, the effect of cooking on the loss/increase of EDCs are under debate; hence cooking methods even contribute the

concentration such as the levels of PAHs are effected by vertical/horizontal barbecue cooking differ as dripping of fat onto the heat source is a primary contributor. Various aspects are related to these hazards including non-monotonic dose response, mixture and very low concentration effects. EFSA set tolerable/acceptable daily intake of some important EDCs; where these amounts should be considered with the maximum residue levels and the residues. Due to the emerging evidence of the adverse outcomes of the exposure of EDCs, risk- reduction measures for the prevention should be harmonized with the principles and methods of risk assessment in accordance to the specific toxicological endpoints and novel methodologies for screening. Permanent monitoring should be applied; where the risk assessment should be translated into enforceable and controllable legislation for optimal consumer protection in terms of EDC contamination through animal origin sources.

Keywords: Endocrine disrupting chemicals, residue, risk, animal origin food

A New Mixed Ca-Alginate-Carob Galactomannan Gel to Preserve Viability and Cholesterol Assimilation Capacity

Oral Presentation

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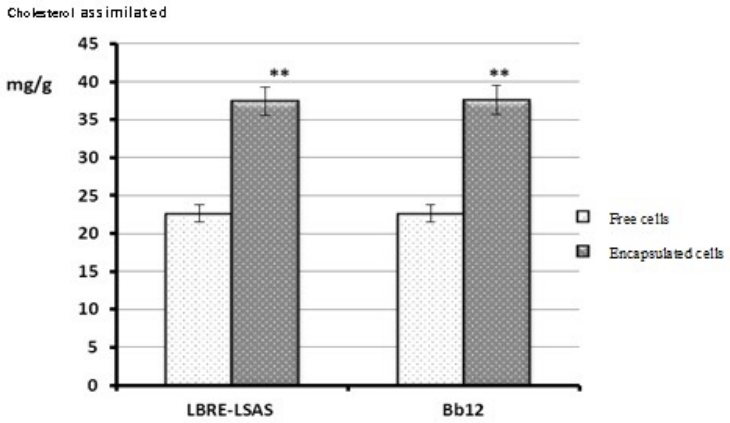
This study aimed to use the extracted galac-tomannan of the carob seeds endospermes in the development of a mixed calcium alginate gel for the encapsulation of a new human isolated strain of Lactobacillus rhamnosus LBRE-LSAS compared with the probiotic strain of Bifidobacterium animalis subsp. lac-tis Bb12. Influence of microencapsulation was tested under deleterious digestive envi-ronment (bile secretions and stomach acidity), to verify if both bacteria preserve their viability and their cholesterol assimilation capacity.

High viable loads of 6.97 and 8.66 of 9 Log CFU. g-1 of LBRE-LSAS and Bb12 were reg- istered, respectively. Conversely, the non-encapsulated bacterial levels strongly ($P < 0.05$) decreased during exposure to the diges-tive simulated conditions. We suggests that the galactomannan gel employed herein was advantageously incorporated in the alginate matrix, allowing more rigidity to beads, de-spite probable different acid and bile salt tolerances of the assayed bacteria.

The effects of the galactomannan –ca-alginate mixed gel on cholesterol uptake abilities of the same bacteria are shown in figure 1. The both strains were able to assimilate cholesterol in the presence of 3 g L−1 bile. Our new galactomannans beads seems to enhance Bile survival which regarded as required condition for better efficacy of probiotics. The cholesterol uptake capacity was conse-quently boosted in the protected cells compared with the non- encapsulated ones.

According to the obtained results, we succefuly introduce galactomannan in the ca-alginate gel matrix. The new gel formed permit to improve 1.8-fold on average the cholesterol assimilation capacity of probiotic bacteria. Considering the increasing interest for the use of probiotic bacteria as natural and healthy solutions in lowering serum cholesterol in humans, we underlined the possible use of these bacteria protected in carob-galactomannan-ca-alginate beads.



Keywords: galactomannan, carob-ca-alginate gel, probiotics, survival, beads, cholesterol assimilation.

Evaluation of Probiotic Properties of Kefir and Determination its Effects on İnflammatory Bowel Disease Patient's Lactobacillus Flora of Gaita and Biochemical Parameters and Symptoms

Oral Presentation

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Probiotics are defined as living microorganisms which are useful for human health when they are consumed in appropriate portions. Kefir, which is a fermented milk drink, has probiotic properties that are thought to balance the degraded microflora. Chronic Inflammatory Bowel Disease (IBD) is divided into two groups which are; Ulcerative Colitis (UC) and Crohn's Disease (CD). It is being observed that the number of cases of UC and CD is increasing rapidly in every age group. The objective of this study was to investigate the effects of kefir consumption on patients' Lactobacilus microflora, biochemical parameters, symptoms and also quality of life of people with IBD.

The patients, who are under regular control of the General Internal Medicine and Gastroenterology Policlinics of Uludağ University All permits are obtained from Uludağ University Ethical Commity (B.30.2.ULU.0.20.70.02-050.99/440, 25.11.2013) for those patients.

Kefir, consumed by patients, had been analyzed microbiologically for their total microorganisms and Lactobacillus flora. The species identification of Lactobacillus isolates were performed by Vitek® MS mass spectrometer (bioMerieux, Marcy l'Etoile, France) and API (bioMerieux).
The study was performed as a single center, prospective, open-label randomized control trial of 48 patients, with IBD who were separated into two groups (28 patients for treatment and 20 patients for control). Three patients drop out the trial with her/ his own wish. Treatment group consumed, 200 ml. each time for day and night which have 2x1010 cfu/400 ml viable cell, for four weeks and control group didn't consume kefir at all. Their lactobacilus and Lactobacillus kefiri flora were quantitated by Real Time-qPCR (Roche LightCycler Nano). After one month administration, the Lactobacillus strain bacterial load of feces of all subjects was 105–107 CFU/g. The Lactobacillus kefiri bacterial load of all subjects was of 104–106 CFU/g. The results of this study indicate that after kefir consumption the Lactobacillus quantity in gaita was statistically significant (p=0.001). At the same time the patient's quality of life about disease, monitored by a symptom diary form that includes parameters as stool consistency, abdominal pain, bloating, defacation frequency and feeling good. Patient's with Crohn's disease showed statistically significant differences in terms of all variables after kefir use. There was a significant decrease in ESR and CRP while Crohn's patients showed an increase in HGB after kefir use. For patients with Crohn's disease, the last 2 weeks of bloating were significantly reduced while patients improved (p = 0.012). At the same time, the feeling good score improved in the last two weeks and patients' condition improved (p = 0.032). No statistically significant difference was found between the

first week and the second week in patients with ulcerative colitis in terms of abdominal pain, bloating, number of stools, defacation consistency and feeling good.

While there were no significant statistical differences between the groups in terms of other variables, there was a statistically significant difference between the ulcerative colitis and control group in terms of stool consistency in the first two weeks ($p = 0.026$), but no statistically significant difference was found in terms of other variables. Ulcerative colitis group's stool consistency score was higher than control group. While there was a significant statistical difference between Crohn and control group for their abdominal pain and bloating scores ($p = 0.006$, $p = 0.003$) there was no other significant statistical difference in terms of other variables. The decrease of abdominal pain and bloating scores of Crohn group was greater than control group in the last two weeks.

According to data from this study, regular consumption of kefir may improve both symptoms and quality of life in short term especially for the patient’s with Crohn Disease.

Keywords: Inflammatory Bowel Disease, Gut Microbiota, Kefir,

Evaluation of Viability of Probiotic Cultures and Growth Inhibition of Listeria monocytogenes in Milk Based European Cranberrybush Fruit Juice Added Functional Drink

Oral Presentation

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Phenolic compounds may not only act as antimicrobial agent for pathogens, but also lead to tolerate or promote of growth of probiotic cultures depend on structure and concentration of phenolic compounds and microbial strain. European cranberrybush fruit (Viburnum opulus L.) contain high amount of phenolic compounds, known for their beneficial health effects such as antioxidant and antimicrobial activities. Listeria monocytogenes is one of the most important foodborne pathogen that responsible for foodborne illness with high mortality rate of listeriosis. In this study, microbial safety of freshly squeezed European cranberybush (ECB) juice added whole milk based drink fermented with probiotics, Lactobacillus plantarum Lp- 115 and Streptococcus thermophilus St-21, was investigated by challenging the product with pathogenic L. monocytogenes ATCC 15313. Firstly, growth and cell viability of L. plantarum Lp-115, S. thermophilus St-21 and L. monocytogenes ATCC 15313 were monitored by assessing optical density at 600 nm at 37 °C for 48 h with microplate reader in MRS for L. plantarum, M17 for S. thermophilus, and BHI for L. monocytogenes, supplemented with different concentrations of freshly squeezed ECB juice (100, 50, 25, 12.5, 6.25, 3.13, 0.78, and 0.39 %) to determine optimum ECB juice concentration for functional drink composition. For preparation of drink, pasteurized whole milk, ECB juice (10%), and glucose (2%) were mixed and then pH was adjusted to 6.0 before fermentation. Probiotic cultures (0.1%, 109 cfu/ml) and L. monocytogenes (105 cfu/ml) were added at the same time both in the presence and absence of ECB juice, and samples were held at 37°C until the pH value of the drink reached to 4.5. Samples were then stored at 4°C for 14 days to evaluate storage period of the drink. The change in the numbers (cfu/ml) of L. plantarum Lp-115, S. thermophilus St-21 and L. monocytogenes ATCC 15313, and pH values were monitored during fermentation (0, 1, 2, and 3 h) and storage period (1, 7 and 14 days) on selective growth media MRS, M17 and Oxford agar for L. plantarum Lp-115, S. thermophilus St-21 and L. monocytogenes ATCC 15313, respectively. Addition of 10 % ECB juice was found as optimum concentration according to optical density values obtained from microplate reader in growth medium of each bacteria. The numbers of probiotic cultures in the presence and absence of ECB juice added samples were similar and did not change significantly during fermentation and even after 14 days of storage. On the other hand, the pH of the samples decreased around 4.27 to 4.17 at the end of storage in the presence and absence of ECB juice. Even though presence of 10 % ECB juice in medium inhibited L. monocytogenes growth, neither significant increase nor inhibition was observed in the presence of ECB juice added milk drink during fermentation and storage time suggesting that food matrixes might have different complexities with respect to growth medium, thus behavior of microorganisms can be affected differently. Protein and/or fat molecules in milk could bind bioactive compounds and/or form a protective coating around bacterial cells by reducing their availability for antimicrobial activity. In further studies, the antimicrobial properties of ECB juice on pathogens in different growth environment will be evaluated.

Keywords: European cranberrybush fruit juice, Listeria monocytogenes, microbial food

Investigation of Antimicrobial Properties of Kefir Prepared with Camel, Goat, Water Buffalo and Cow Milk and Made with Different Kefir Grains

Oral Presentation

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Kefir, which means "enjoyable" and believed to have originated in the Caucasus, is a fermented dairy product made from ancient times. Kefir is considered a natural probiotic, including microorganisms and metabolites of these microorganisms. In addition, kefir contains essential nutrients such as protein, fat, carbohydrates, vitamins and minerals necessary for human nutrition. Turkey and in the world increased interest in fermented food commercial kefir consumption increased with each passing day and for nutrition and public health kefir production quality and safety have gained importance. Kefir are produced with kefir grain particles in the appearance of 3-20 mm in diameter, small white or yellowish cauliflower or popcorn, are added to cow, goat and sheep milk and fermented under appropriate conditions.

Milk obtained from different animals has some important qualities in terms of food technology as well as nutritional and health characteristics of the nutritional elements and chemical properties. Kefir, concerning the antimicrobial property effects for ensuring the stability of some enteric pathogens, stomach and intestinal flora is still being investigated. It is expected that the antimicrobial effect will be different due to the different composition of kefir obtained from different animal milk. The aim of this study is to examine the in vitro effect of kefir made with different animal milks and three different kefir grains on some microorganisms.
Experimental kefir production was carried out in this study by using three different kefir grains (were named as M1, M2, M3) and cow, goat, water buffalo and camel milk with traditional method under laboratory conditions. Raw cow, water buffalo and goat's milk from farms located in Çatalca District Nakkaş Village (Turkey / Istanbul) and camel milk was obtained from the farms in Khorkhor Village of Tebriz (Iran/Tabriz). Two kefir grains (M1, M3) were provided by the people from Istanbul and one of the kefir grains (M2) was obtained from Iran-Tabriz. For experimental kefir production, under aseptic conditions, raw milk is heated by continuous stirring for 20 minutes at 85-90 oC, cooled to 20-25 oC and added 2-10% of each of the kefir grains, followed by 12 hours at 20-25 oC (cow, goat, buffalo milk) and 72 hours (camel milk). Using the disk diffusion method, antimicrobial activity of kefir samples on Listeria monocytoges ATCC 13932, Staphylococcus aureus ATCC 25923, Escherichia coli ATCC 25922, Salmonella enteritica ATCC 13076 and Bacillus cereus ATCC 11778 were investigated.
The highest antimicrobial effect was found in kefir made with camel milk and two different kefir grains (M2 and M3). These kefirs showed antimicrobial activity at various rates on all microorganisms investigated. Kefir made with another one kefir grain (M1) and camel milk showed antimicrobial activity only on Listeria monocytoges ATCC 13932. In other kefir made with water buffalo, cow, goat milk, antimicrobial activity has been found to be significantly different among the kefir grain used.

In many studies has been reported kefir has on antimicrobial activity on many microorganisms and as treatment support for enteric infections. However, the activity on kefir

microorganisms made with different animal milks has not been investigated. In this study, the antimicrobial activity of kefir made with different animal milks was determined on some gram negative and gram-positive bacteria. The results obtained are thought to can help the use of kefir in support of the treatment of foodborne enteric pathogens.

Keywords: Antimicrobial, Bacteria, Camel, Kefir, microbiology, milk

Salmonella Control in Poultry Housings with Probiotics

Oral Presentation

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Salmonellosis is one of the most important foodborne illnesses. Although serovars that cause human disease are commonly found on all kinds of food products, poultry is still considered as the major source. Salmonella spp. are natural members of the chicken intestinal flora and can threaten food safety if they grow uncontrolled.

Methods
The habitats where Salmonella spp. grow are chicken intestine and bedding. With effective monitoring and control programs, the danger of Salmonella can be reduced. Prevalence studies in broiler have shown a reduction of Salmonella-positive values: EU: 2006-23.7% to 2016-2.6%; USA: 2008-15% to 2014-9%. Turkey: 2015-32.6% to 2017-34.7.

Several methods for the control of Salmonella are used: sanitization of feed with heat treatment (pelleting), vaccines, antibiotics, biocidal chemicals, prebiotics and probiotics. In this study, a probiotic Bacillus subtilis strain isolated by Simbiyotek A.Ş. was used. 1 L, at least 2x109 CFU / g Bacillus subtilis spore formulation was diluted with 10 L water and sprayed on approximately 500 m2 area.

Samples taken from the bedding were divided into small pieces and put into a buffer solution. After mixing in shaker, appropriate dilutions were made and spread on media. For live cell counts the media PCA for bacteria, and PDA for fungi were used. Salmonella analysis in bedding samples and drag swabs. was carried out according to the method of BAM 2002, 2007. The acidity of 1 g sample added into 10 mLwater was determined by titration with of 1 N NaOH, up to pH 8.5.

Results
Oxygen-free zones in the bedding provide a suitable environment for propagation of pathogens. Experiments were carried out with bedding material without litter. Control samples had fungi counts about 10-fold and bacterial counts 2-fold higher than B.subtilis-treated-samples. B.subtilis suppresses fungi and other bacteria in anaerobic environment.

Farm trials were carried out in Adapazarı region.

2008-December
B.subtilis sprayed on bedding only once before the chicks entered (day 0), control sprayed with water. Bedding samples taken on the 7th and 21st days after application. B.subtilis-day-7-sample: bacteria and fungi counts are lower and Salmonella-negative. Day-7- control-sample: Salmonella-positive. On day 21 both samples Salmonella-positive.

B.subtilis can suppress other microorganisms, but because of continuous addition of fresh litter on to the bedding, the pathogens could dominate the environment again. So it will be

recommended to repeat spraying every 7-10 days.
In 2016, a 4 period trial was carried out on a farm with 3 poultry housings.

2016-13.week:
One of the three housings (28,900 broilers) is Salmonella positive (drag swab) after disinfection. B.subtilis sprayed on bedding at days 0, 7, 14, 21, 28 and 35. No antibiotics were used except the first week. Probiotics given with drinking water: 0- 2 days Pediococcus acidilactici and B.subtilis from day 21 up to slaughter.
RESULT: all samples of days 7, 14, 35 and 41are Salmonella-negative

2016-22. week:
3 housings (12 9600 broilers) sprayed with B. subtilis on days 0, 7, 14, 21; P.acidilactici for 3 days with drinking water after antibiotic application in the first week.
Result: all 35th day and slaughterhouse samples Salmonella-negative.

2016-31. week:
Same application in 3 housings (131000 broilers). Result: all Salmonella-negative at the end of the period.

2016-41. week:
3 housings (125840 broilers) without any probiotic application. Although all of the chicks were Salmonella-negative at the beginning, all housings were found Salmonella-positive at the end of the period.

Discussion
Probiotic bacterium, Bacillus subtilis, applied on bedding can suppress Salmonellae so that drag swab samples are Salmonella-negative. With probiotic use in poultry breeding, Salmonella can be controlled, food safety can be ensured, a high quality and economical production can be achieved.

Keywords: Salmonella control, probiotics, Bacillus subtilis, bedding applications

Identifying Indigenous Bacteria Producing Antimicrobial Agents in Some Spices

Oral Presentation

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According to the recent scientific researches on chemical antimicrobial agents, it was reported that these agents have several negative effects. In addition to that, as a result of common use of synthetic antimicrobial agents, the resistance mechanisms of pathogenic bacteria were enhanced.

Also, the interest in natural foods and food products produced by using natural components increased among consumers. This situation gave acceleration in researces about new antimicrobial agents.
The present research was carried out with the aim of determining the microorganisms in spices being able to produce natural antimicrobial agents which can substitute for synthetic antimicrobial agents.

For this research, 33 different types of spices were supplied from a herbalist in Kayseri and they were analyzed for the microorganisms that produce antimicrobial agents. The spices were individually homogenized in sterile pepton water and diluted serially. Then, the samples were plated on four different agar medium (Nutrient Agar, Tryptic Soy Agar, Brain Heart Agar, Plate Count Agar) and incubated at 30±1°C for 48 hours.

Different colonies were chosen from the petri dishes for the isolation of microorganisms produce antimicrobial agents. The chosen colonies were plated on the soft Tryptic Soy Agar which contains the test microorganisms, Listeria innocua, Micrococcus luteus, Escherichia coli and Saccharomyces cerevisiae. They were incubated at 37±1°C for 24 hours. At the end of the incubation the zones and the activities against these microorganisms were determined. Then, the metabolites obtained from the isolates which show antimicrobial activity were inoculated on the soft TSA contains the test microorganisms and incubated at 37±1°C for 24 hours. The incubation area was observed and clear zone formation was accepted that the bacteria can synthesize antimicrobial agents.

Characterisation of the microorganisms produce antimicrobial agents was performed by using PCR based methods according to 16S rRNA gene region. For this purpose, first bacteria DNAs were isolated and amplified by using thermal cycler. Then the PCR products were observed through agarose gel The PCR products were purified and sent for sequence analysis. At the end of the analysis, the DNA sequences and the datas of genbank were compared the bakteria isolates were identified.

As a result of genotypic identification and antimicrobial tests, total of 19 bacteria [Listeria innocua (4), Micrococcus luteus (9), and Escherichia coli (6)] having antimicrobial effect were determined. As a result of confirming the antimicrobial effect by extraction method, the

antimicrobial effect of total 14 samples on L. innocua (4 samples), and M. luteus (4 samples), E.coli (3 samples), and both L. innocua, and M. luteus (3 samples) were determined. In this study, a microorganism having antimicrobial effect on both Gram negative and Gram positive bacteria were not determined. Total 7 of bacteria isolates having the antimicrobial effect were genotypically determined. As a result of genotypic identification of the isolates, 6 isolates were forming endospores including Bacillus sp. (4 isolates) and Paenibacillus sp. (2 isolates), and remaining 1 isolate was determined as Micrococcus sp.

In this research, the most common isolates which show antimicrobial effects were determined

to be Bacillus sp., Paenibacillus sp. and Micrococcus sp. In the previous studies, it was already found that some strains of Bacillus sp., and Paenibacillus sp. have antimicrobial activity in harmony with the present study. Yet, there is no study encountered about Micrococcus sp. Therefore, the metabolite obtained from this bacteria is thought to be an antimicrobial agent which has not been identified before.

In conclusion, it might be suggested that the spices may have some bacteria that producing antimicrobial agents need to be studied in more detail.

Keywords: Antimicrobial, Bacillus sp., Micrococcus sp., Paenibacillus sp., PCR, Spices