Title: Consumer attitudes and perceptions towards chilled ready-to-eat foods - a multi-national study

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1. Abstract

Understanding the consumers' behavior and their home practices, as well as handling of high-risk foods is essential for reducing the number of foodborne illnesses. The objectives of the present study were to analyze a cross-national consumers' perception, including nine countries, identifying customers' clusters and its characteristics. The aim of such segmentation was to understand customers' behavior to build upon prevention strategies to provide safe chilled ready-to-eat (RTE) foods. Cluster analysis has resulted in two clusters. The first cluster, "Precautious consumers" was characterized by the orientation towards pre-packed RTE foods, with consumers mainly coming from Bosnia and Herzegovina, India, Poland, Portugal, Spain, and Turkey. Their attitudes and self-reported practices may be categorized as less risky in terms of food-borne illnesses connected with the consumption of RTE foods. The second cluster, "Unconcerned consumers" included consumers preferring freshly cutting and slicing RTE foods at the point of purchase, usually sold at the delicatessen department in a supermarket or at open markets. They are mostly consumers coming from Croatia, Serbia and Slovenia. Results of this study clearly show that their attitudes and self-reported practices might be considered more risky. Obtained results allow better understating of what characterizes RTE foods consumers in different countries.

Keywords: consumers' perception; chilled ready-to-eat foods; food handling; food safety.

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2. Introduction

Food-borne diseases include various illnesses ranging from mild gastrointestinal issues to life threatening illnesses such as meningitis, septicemia, spontaneous abortion, still birth, hemolytic–uremic syndrome, Guillain-Barre syndrome, etc. (Bari and Yeasmin 2018; Gandhi and Chikindas 2007). The World Health Organization (WHO) has estimated the burden of food-borne diseases, with more than 420,000 millions of people fall ill, and 230,000 dies every year from diarrheal diseases, caused by consumption of contaminated food and/or water (Kirk et al. 2015). Although the majority of cases occurs in developing countries, a great number of people in developed countries still experience some food-borne diseases (EFSA 2021; Painter et al. 2013). More than 3,000 foodborne outbreaks and more than 30,000 cases of illness have been reported only in EU in 2020 (EFSA 2021), despite the COVID19 pandemic and the withdrawal of the United Kingdom from the European Union (EU).

Ready-to-eat foods (RTE) include foods prepared in advance that may be safely consumed without any further cooking or processing step. The trend of consumption of this type of foods is still growing due to a changing lifestyle. As they are typically consumed as raw or minimally-processed, hence they may contain pathogens, such as *Listeria monocytogenes* which exhibits a high survivability rate and has been isolated from various RTE foods in Spain (Gómez et al. 2015; Jofré et al. 2019), Serbia (Borovic et al. 2014; Lakićević et al. 2010), India (Lakhanpal et al. 2016), Poland (Szymczak et al. 2020) or Turkey (Şanlıbaba et al. 2018). Among these, delicatessen meats, smoked and cured fish, soft cheese, ice cream, produce (diced celery, cantaloupe, mung bean sprouts, stone fruit, caramel apples, pre-packaged salads) and frozen vegetables have been implicated in recent outbreaks (Chao et al. 2006; Cordano and Jacquet 2009; Gérard et al. 2018; Verraes et al. 2015; Zhang et al. 2021). Although the rates of listeriosis are relatively low in comparison to other foodborne pathogenic illnesses, it poses a significant risk to human health due to high mortality rate (Buchanan et al. 2017).

Chilled RTE foods include pre-sliced and pre-packaged foods sold in the original packaging, and that has to be distributed in the cold chain. Slicing is often applied as a final step of heat-treated foods before they are packaged, often in vacuum or modified gas packaging (Gonzalez-Fandos et al. 2021). At the same time, the consumers are offered chilled RTE foods that are produced in bulk and then sliced fresh on point of purchase for each individual consumer. These products are called cut-to-order, in-store packaged or non-pre-packaged RTE foods (V. Garrido et al. 2009; Tsaloumi et al. 2021). For pre-packaged RTE foods sold in original package from the producer, the contamination usually occurs during the manufacturing process. However, for retail packages, where the products are handled in retail establishments, the slicers used, the personnel and the food service environment can lead to cross-contamination of the products (Gallagher et al. 2016; Lakicevic and Nastasijevic 2016). Contamination of RTE foods by *L. monocytogenes* can occur at different points in the processing and distribution chain, although the post processing contamination during slicing at retail stores may result in considerable higher prevalence of contamination when compared to pre-packaged food products (Endrikat et al. 2010; Gallagher et al. 2016; V. Garrido et al. 2009; Gombas et al. 2003). The results of comparative risk assessment indicated that retail-sliced RTE meat and poultry products are almost five time more likely to cause listeriosis than pre-packaged food products (Endrikat et al. 2010). At the same time, results of quantitative modeling performed by European Food Safety Authority (EFSA) have indicated that more than 90% of all invasive cases of listeriosis is caused by ingestion of RTE foods that contain >2,000 CFU/g, with one-third of cases caused by factors occurred at the consumer phase (Ricci et al. 2018). Therefore it is necessary to raise the awareness of all stakeholders in the RTE foods supply chain, including food producers, retailers and consumers, especially vulnerable groups of consumers about the problem of *L. monocytogenes* in RTE foods. The results of recent quantitative risk assessment of *L. monocytogenes* in RTE cooked meat products sliced at retail stores predicted a median value of 7 listeriosis cases per year for the total population in Greece and different cooked meat products. They also proposed some mitigation strategies, such as labeling a use-by-date and improving the temperature of domestic refrigerators, which might decrease the number of potential cases (Tsaloumi et al. 2021).

The final consumers have been seen as the last line of defense against foodborne illnesses (Redmond and Griffith 2003). Most cases of foodborne illnesses are believed to be sporadic, mild and unreported, and often occur in the

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domestic settings (Murray et al. 2017; Nesbitt et al. 2009). Consumers often fail to follow individual recommended food safety practices, such as those relating to time and temperature control of chilled RTE foods (Evans and Redmond 2014), but also they misinterpret the food labels (Van Boxstael et al. 2014). Understanding the consumers' behavior and their home practices, as well as handling of high-risk foods is essential for reducing the number of foodborne illnesses. Several studies have reported consumers' behaviors towards RTE foods (Cates et al. 2006; Evans and Redmond 2016; Van Loo et al. 2010). Recently, a study was performed to better understand how consumers perceive food safety risks in retail food store settings, using selected photographs and self-reported perceptions, attitudes, and behaviors (Levine et al. 2017). Their results indicated that consumers with a food science background may be more knowledgeable about factors contributing to food safety risks than the average focus group participant. Jevsnik et al. (2008) reported that Slovenian consumers were not familiar with their role in the food safety chain or with the importance of maintaining a cold chain, and as a consequence they allow numerous opportunities for microbiological contamination of food (Jevšnik et al. 2008). Similarly inadequate behavior and lack of knowledge concerning food safety issues was reported for Polish (Tomaszewska et al. 2020) and Turkish consumers (Ergönül 2013; Zorba and Kaptan 2011). At the same time inadequate temperatures in an open refrigerated display at retail in Spain might allow pathogen to grow in RTE seafood (González et al. 2013). Temperature distributions within the home refrigerators and their inadequate hygiene were of major concern of food safety issues in several studies performed in Serbia (Jovanovic et al. 2022), Portugal (Azevedo et al. 2005), India (Lagerkvist et al. 2021), Slovenia (Ovca et al. 2021) and Spain (Victoria Garrido et al. 2010; Jofré et al. 2019).

Due to the unique habits of people from different regions in food consumption and buying (Chen and Antonelli 2020; Djekic et al. 2021), we hypothesize that survey participants would exhibit differences in attitudes and practices towards chilled RTE food. Therefore, the study objective was to analyze a cross-national consumers' perception, including nine countries, identifying customer segments and its characteristics. The aim of such segmentation was to identify the profile of consumer that performs risky practices towards chilled RTE foods. It would provide the information necessary for making further recommendations for the strategy of risk mitigation at the multinational level.

3. Material and methods

3.1. Participants

In order to study the attitude and beliefs of consumers regarding RTE foods, an online survey was created using Google Forms® online platform. It was conducted in nine countries including Bosnia and Herzegovina, Croatia, India, Poland, Portugal, Serbia, Slovenia, Spain and Turkey. The responses were collected by convenience sampling via social media and e-mail via in-country contacts that were responsible for its distribution among pre-existing contact lists. In this way, the restrictions imposed by the COVID-19 pandemic worldwide could be overcome. Participants in this study were volunteers, aged over 18, not financially rewarded, and recruited through networks of families, friends, relatives and their networks. Participants who did not complete the whole questionnaire were excluded from the analyses. The data were collected between June and December 2021, and centrally stored at the personal computer of the first author of this paper. All study procedures were conducted in line with Codex of professional ethics of the University of Belgrade (Serbia 2016).

The total number of collected questionnaires was 2,723 and included: Bosnia and Herzegovina 449 (16.5%), Croatia 353 (13.0%), India 210 (7.7%), Poland 305 (11.2%), Portugal 352 (12.9%), Serbia 387 (14.2%), Slovenia 106 (3.9%), Spain 200 (7.3%), and Turkey 361 (13.3%) (Table 1). The country-by-country sample sizes for the purpose of a study of this nature could be considered small (Table 1). However, considering the populations in the individual countries, at a confidence level of 95%, the margin of error varies from 4.6% to 9.5%. While at a confidence level of 90%, the margin of error varies from 3.9% to 8.0%. Therefore, the conclusions drawn from this study still represent a reasonable alignment with the individual countries. Margins of error were calculated using the standard deviation of the population (σ), the sample size (n) and the z-score of the confidence interval (for 95% = 1.960, for 99% = 2.326): $z * (\sigma/\sqrt{n})$.

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3.2. Questionnaire

An extensive questionnaire was initially written in English and subsequently translated by native speakers (to ensure accuracy and preserve its original meaning) into languages used in participating countries, using the procedure of back-translation (Maneesriwongul and Dixon 2004). The questionnaire was designed with the objective to gather the information of consumers' attitudes and self-reported practices regarding food safety of chilled RTE foods. To measure internal consistency and reliability of the questionnaire, Cronbach's alpha test was calculated and it was 0.736, which is considered acceptable (Bland and Altman 1997).

At the beginning of the questionnaire, the participants were introduced with the aim of this study and a definition of RTE foods that was given to ensure that all respondents understood the meaning in the same way. The definition was as follows: "Ready-to-eat food is food prepared in advance needing no further cooking or processing before being served/eaten. This study covers only chilled RTE dairy and meat foods." Along with this definition, other terms used in the questionnaire were also explained, such as "pre-packaged products" and "cut-to-order products".

The questionnaire consisted of four sections. The first section comprised of questions related to main demographic characteristics of participants including country, gender, age, education, number of family members and if there is a small child, pregnant women, person older than 60 years, and person(s) with compromised immune system (diabetes, liver or kidney disease, cancer, autoimmune diseases, people receiving chemotherapy or radiation therapy, people with organ transplant) in the household. In addition, this part of the questionnaire investigated the responsibility of buying, preparing and serving food. The second section included questions related to habits of purchasing (pre-packaged in a supermarket/specialized shop, cut-to-order in a supermarket/specialized shop, open market/open bazaar and not buying) and habits of consuming chilled RTE foods (RTE foods, ingredient of thermally treated products, not buying), including fresh cheese, white brined cheese, kajmak/butter, sliced hard cheese, cooked ham, fermented ham, dried ham and salmon. The third section included 22 statements related to consumers' attitudes towards food safety of chilled RTE, which were presented on a five-point Likert Scale, ranging from "Strongly Disagree" to "Strongly Agree" (1→5). Final section of the questionnaire comprised of 15 statements related to self-reported practices with a five-point Likert Scale, ranging from "Never" to "Always" (1→5).

3.3. Data analysis

The obtained data were coded and analyzed in IBM SPSS version 21 by two-step cluster analysis. This is an exploratory and unsupervised multivariate data analysis technique that enables the clustering of large data sets. This method is based on a probabilistic approach, when the algorithm utilizes a likelihood distance measure as the similarity criterion, and the most suitable number of clusters is chosen on the basis of Schwarz's Bayesian inference criterion (BIC). The number of clusters is calculated based on the best fit, the BIC, and a silhouette coefficient. The silhouette coefficient is a measure of clustering quality that is independent from the number of clusters (K), and can be used to evaluate cluster validity. The clustering solution is considered poor when the silhouette measure is lower than 0.20, values of more than 0.50 indicate a good solution, and intermediate values can be considered as acceptable clustering solution (Mooi and Sarstedt 2011). Two-step cluster analysis has been considered to be more accurate and reliable comparing to other clustering methods and was extensively used in different fields (Tkaczynski 2016) and in numerous consumer studies (Geeroms et al. 2008; Miloradovic et al. 2021; Zakowska-Biemans 2011; Zhllima et al. 2021).

For all the mentioned reasons, two-step cluster analysis has been used for the segmentation of consumers in this study, based on items describing place of buying various RTE foods and countries, as categorical variables. The two-cluster solution was obtained automatically by BIC with 15 clusters set as maximum. Log-likelihood distance measure was used. To further characterize the clusters and to investigate any significant differences between the clusters, the Chi-squared tests and Mann-Whitney U tests were conducted for variables with nominal and ordinal outcomes, respectively. The level of significance was set at 0.05.

4. Results and discussion

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4.1. Characteristics of the sample

Socio-demographic data showed that 2,723 participants have been interviewed. The survey was completed by 67.2% female, 32.1% male and 0.7% participants not willing to declare gender. The majority were adults 44.9% (between 21 and 40 years of age), followed by middle-aged adults 31.2% (between 41 and 60 years of age), older participants 17.8% (over 60 years). The smallest sample included young people, with less than 20 years (6.2%). The majority of survey participants obtained College/University degree (55.0%), 22.2% of participants obtained Master/PhD degree, 20.65% had high school diploma and only 2.2% had only elementary school diploma. As mentioned earlier, participants from nine countries were included in this survey (Table 1).

4.2. Cluster analysis

In order to identify the profiles of consumers and to define their attitudes and self-reported practices related to chilled RTE foods, a cluster analysis was performed. The sample was divided in two clusters according to their preferences towards place of purchasing RTE foods (supermarket or delicatessen department/open market), forms in which RTE foods is sold (pre-packaged/not buying or cut-to-order) and country of origin. These variables have been selected due to the fact that there is positive correlation between consumer's perception towards the product quality and choice of store (Catherine and Magesh 2016). Additionally, customers from different countries are expected to have different purchasing behavior, and thus different perception towards RTE foods (Djekic et al. 2021). Demographic characteristics and habits regarding place of buying RTE foods are presented in Table 2 and 3, respectively. Silhouette measure of cohesion and separation (0.30), and the ratio of largest to smallest cluster size (1.11) confirmed that having two clusters was the acceptable and optimal solution. Cluster 1 consisted of 1,434 cases (52.7%), while cluster 2 consisted of 1,289 cases (47.3%).

Cluster 1 consisted of 1,434 consumers, representing 52.7% of the total sample. It included predominantly consumers from Bosnia and Herzegovina (51.7%), India (71.4%), Poland (55.1%), Portugal (57.7%), Spain (58.5%) and Turkey (74.8%). Consumers that have been classified in this cluster include young (66.1%), adults (54.5%) and middle aged (52.8%) participants, with the education of high school (53.4%), graduate (50.6%) and post-graduate (57.9%). Furthermore, this cluster includes participants from households that predominantly do not live with old persons (55.1%), or pregnant women (53.2%). This group represents highly educated customers which suggest its involvement and higher level of safety awareness. At the same time, the participants that belong to this cluster are those with a habit of buying pre-packaged dairy and meat RTE foods in a supermarket and specialized shops or they do not buy these food products at all (Table 3). This cluster can be labeled as: "Precautious consumers".

Cluster 2 consisted of 1,289 consumers, representing 47.3% of the total sample. This cluster included predominantly consumers from Serbia (71.1%), Croatia (63.2%) and less but over the average consumers from Slovenia (50.9%). They were mainly low educated consumers with only elementary school finished (54.2%), old participants aged >60 years (56.8%), living in the household with old persons (51.4%), and living in the household with pregnant women (56.1%). This group consists of less educated and old people. They have a habit of buying cut-to-order RTE foods at the delicatessen department of a supermarket, or at the open market (Table 3). Having all this in mind and due to the fact that cut-to-order foods are recognized as more risky foods, cluster 2 could be named as: "Unconcerned consumers".

The chi-square test was used to check for significant differences between the two clusters for 12 socio-demographic variables (Table 2). Eight out of the 12 variables were significantly different, namely country, age, education, employment, responsibility for purchasing and preparing foods and old person living in the household ($p<0.05$, Table 2). In addition, chi-square test was applied to determine significant difference between the two clusters for habits related to place of buying RTE foods and obtained results indicated significant difference between clusters for all food categories ($p<0.05$, Table 3).

4.3. Attitudes towards chilled RTE foods

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In general, chilled RTE foods are characterized as risky foods due to characteristics that permit the growth of *L. monocytogenes* (Kovačević et al. 2012; Luber et al. 2011; Uyttendaele et al. 2009). These foods include pre-packaged sliced meat products, soft cheeses, smoked fish, sandwiches, processed meat products, etc. However, pre-packaged chilled RTE foods are considered to be less risky when compared to retail-sliced or cut-to-order foods, that is handled in commercial establishments (e.g. delicatessen, supermarkets) (Endrikat et al. 2010; Gallagher et al. 2016; V. Garrido et al. 2009; Gombas et al. 2003). Our results indicated that "Precautious consumers" were significantly more convinced than "Unconcerned consumers" that pre-packaged RTE foods are safer than cut-to-order ($p<0.05$, Table 4). They also viewed purchasing of cut-to-order RTE foods at the delicatessen department in a supermarket or at the open market as significantly less safe than it was for "Unconcerned consumers" ($p<0.05$). This is in line with their habit of predominantly buying various chilled RTE foods, already pre-packaged by the food producers. The consumers from Bosnia and Herzegovina, India, Poland, Portugal, Spain and Turkey mostly belong to "Precautious consumers", and their positive attitudes towards safety of pre-packaged foods is in line with their general habits of buying foods in large grocery stores and supermarkets, which can be seen as precautionary and preventive and explain the label that is given to the members of this cluster. The official epidemiological data indicated the incidence rate of listerosis in some countries Spain, Portugal and Poland was relatively high, being on the average 0.72, 0.47 and 0.28 per 100 000 population per year (EFSA 2021). Although consumers are not expected to read and analyze statistical data, the higher incidence rates in these countries can indirectly lead to more information covering this issue in the media. It is important to note that one of the greatest European outbreak caused by *L. monocytogenes* contaminated RTE meat products resulted in more than 200 confirmed cases and 3 deaths (Fernández-Martínez et al. 2022). Also in Portugal contaminated cheese induced an outbreak in Portugal with more than 30 cases and 1 death (Magalhães et al. 2015). The importance of *Listeria* prevention in RTE foods may be also attributed to the fact that great production of RTE for European market is done in Poland (Szymczak et al. 2020), and one *Listeria* outbreak was caused by smoked salmon produced in Poland (EFSA 2018). The media attention for these outbreaks may indirectly raise awareness among consumers and make them more precaution. It is of note that Turkey and India do not have an active surveillance system covering the incidence of listeriosis, and in Bosnia no cases of listeriosis have been previously reported (Musa et al. 2020).

esults also indicated that "Unconcerned consumers" believed that it was safe to buy cut-to-order RTE foods at the delicatessen department in a supermarket. When these participants have been asked about the safety of buying dairy and meat RTE foods at the open market, they were mostly neutral, but still significantly more agreeing compared to "Precautious consumers" ($p<0.05$). This is in line with results reported for UK consumers, who have no concerns regarding food safety of various products from farmers' market (Worsfold et al. 2004). It is of note that very small percentage of the total population that participated in this study regularly purchase dairy and meat RTE foods at the open market (Table 2). Open markets or sometimes called farmer markets are convenient places to purchase foods due to close location, the person-to-person interaction with the sellers, and the quality and freshness of the food, which is perceived to be better than in a supermarket. These markets are especially important for older consumers, as they have shopped there for years and often have developed a close relationship with the sellers (Polimeni et al. 2018). These have remained important places for purchasing local foods in some eastern European countries (Polimeni et al. 2018), despite the competition from the supermarkets and industrially processed foods (Lovre and Brankov 2015). Consumers from Croatia, Serbia and Slovenia, which are mostly "Unconcerned consumers", still hold food traditions and loyalty to local shops and open markets in higher regard than others. This is in line with the recent study (Miloradovic et al. 2021), where greater percentage of consumers from Serbia and Croatia purchasing artisan cheeses at the open markets compared to Spanish consumers, was reported. Nevertheless, at these markets a wide variety of foods are on sale, some of which would be regarded as high-risk such as dairy, meat and fish products (Sirsat et al. 2015). Specific processing and handling measures, time and temperature control have to be taken to ensure the safety of the products sold to the consumers, and this is especially important for unpackaged and unwrapped RTE foods. Therefore, it is essential to design and develop training material to increase awareness and improve knowledge of the consumers regarding RTE foods sold at the open market. This is especially important, having in mind the latest European initiatives for resurgence of small producers, local foods and consequently local open markets, and in

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general short supply chain (Carey et al. 2011; Kneafsey et al. 2013; Warsaw et al. 2021). The incidence rate of listeriosis in Serbia and Croatia was reported to be lower than those from other cluster, being on the average 0.12 and 0.13 per 100 000 population per year and no big outbreak has previously (EFSA 2021; Serbia 2019). This might be used to explain more relaxed attitudes of the consumers from this cluster. On contrary the incidence rate of listeriosis in Slovenia was higher (0.8 cases per 100 000 population per year (EFSA 2021)) and is in line with the situation in countries belonging to other cluster. These results might be related to the fact that Slovenian consumers were almost equally divided among two clusters (Table 2).

To restrict the growth of any food-borne pathogen, but in particular to inhibit the growth of *L. monoytogenes*, temperature has to be controlled throughout distribution and storage, both at the retail and consumers' settings. The food producers are responsible to provide necessary information on the food label, such as recommended temperature of storage and the shelf-life (EC 2002; EU 2011). "Precautious consumers" are more aware of the need to check the expiration date on the food package and to adequately store RTE foods according to the producers' instructions than the other cluster ($p<0.05$). Despite the positive attitudes of "Precautious consumers" towards these issues, the question is whether product declarations always provide sufficiently detailed information, especially when it comes to risky products. Results from the recent study performed in Belgium are of great concern in this regard, as it was reported that food labels of refrigerated RTE foods often lack any (5.7%) or specific (2.7%) recommendations about storage conditions (Ceuppens et al. 2016). Results of the same study also showed that the most frequent recommended storage temperature given on food labels was 7°C, followed by 4°C (Ceuppens et al. 2016). It is the question to what extend the recommended temperature from the label will be ensured during storage at the consumers' level. It seems that domestic storage of chilled foods is highly variable and frequently performed at the temperatures higher than recommended (James et al. 2017; Jofré et al. 2019; Jovanovic et al. 2022; Koutsoumanis et al. 2010; Roccato et al. 2017). The results obtained in this study showed that for "Precautious consumers" ensuring temperature below 5°C and adequate separation of foods in domestic refrigerators was significantly more important for safety of RTE foods than for "Unconcerned consumers" ($p<0.05$). Therefore, it is important to adequately inform and educate consumers about the importance of temperature control in their households, as the improvement of the domestic refrigerators' temperature is seen as potential mitigation strategy for the reduction of number of listeriosis cases (Tsaloumi et al. 2021).

Modified atmosphere packaging is usually applied to food products to prolong shelf-life of RTE foods, by preventing growth and/or survival of various food-borne pathogens (Czerwiński et al. 2021; Kramarenko et al. 2016). However, this hurdle often applied in food industry is removed once the package is open at the consumers' level, which might result in potential outgrowth of present microflora. Food legislation requires a list of mandatory information to be given for the pre-packaged food products, and appropriate storage instructions and/or time limit for consumption after opening should be indicted only "where appropriate" (EU 2011; Serbia 2017; Tsaloumi et al. 2021). This leaves the food producers to decide themselves if they are going to provide information on the safe storage after opening or not. The UK Food Standard Agency have issued the recommendation to limit the shelf-life of RTE deli meats up to 2 days after opening at 5°C (FSA 2022), while the U.S. Department of Agriculture (USDA) indicated a storage period for deli meats after opening to be 3-5 days at 5°C (USDA-FSIS 2016). It is worth noting that the difference in recommended period of opened storage is most likely related to difference in setting criteria on *L. monocytogenes* in these products. US legislation applies "zero tolerance" approach for *L. monocytogenes* in RTE meat and poultry products (USDA-FSIS 2014), while EU uses a "risk-based" approach, considering acceptable values to be below 100 CFU/g throughout the entire shelf-life (EU 2005; Neri et al. 2019). The consumers from this study have been asked to indicate the level of agreement for the statement: "An opened pre-package of sliced cooked ham is safe to eat as long as it is within the use-by date". The average level of agreement for "Precaution consumers" was lower compared to "Unconcerned consumers" ($p<0.05$, Table 4). It can be assumed that the lack of available information on the package of chilled RTE foods might explain obtained results. Almost 80% of food labels from Belgium market contained no indication of the remaining shelf-life after opening the package (Ceuppens et al. 2016). To confirm this and to make adequate base for improvements in this field, further study have to be performed to determine what kind

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of information should be available on chilled RTE foods in different countries involved in this survey. When there is no information on the packaging, and when consumers are not aware of how to handle opened product, then they make decisions independently and randomly. For high-risk foods, a situation where full responsibility is transferred to the final consumer, have to be avoided.

When it comes to the shelf-life of cut-to-order RTE foods, our results indicated that consumers across all involved countries do not agree of knowing the shelf-life and storage instructions for these foods. Food legislation around the world requires a list of mandatory information to be given for the pre-packaged food products (EU 2011; India 2011; Serbia 2017; Turkey 2017). Nevertheless, EU regulation stipulates that for the non-pre-packaged foods the consumers must be provided with only limited information such as the name of food, the allergens, a meat content (for meat products) and an irradiated food statement (for irradiated foods) (EU 2011). Therefore, it is not surprising that the population investigated in this study does not actually know the shelf-life of cut-to-order RTE foods, either bought at the delicatessen or at the open market, and no difference was determined among the two identified clusters ($p>0.05$). Their perception and personal assessment will be the only available tool to judge the shelf-life duration of these risky foods. Having all above in mind, it can be concluded that "Unconcerned consumers" are consumers that prefer cut-to-order RTE foods, are exposed to higher risks of foodborne illnesses, due to the risky nature of these products, as well as due to unavailability of storage instructions and time limitation for the home storage. The attitudes of "Unconcerned consumers" can be seen as more traditionalist and oriented towards local markets, but at the same time careless and unconcerned, and therefore explain the label that is given to members of this cluster. This is further confirmed through their attitudes regarding the assessment of edibility of food products, as they were significantly more convinced that food safety of chilled dairy and meat RTE foods can be judged based on the appearance, smell or food taste**,** compared to the "Precautious consumers" ($p<0.05$). This is also in line with other reported studies, which showed that consumers often use visually, olfactory and tasting factors combined with the shelf-life date to decide if they are going to consume food or not (Van Boxstael et al. 2014).

4.4. Self-reported practices towards chilled RTE foods

Not only the attitudes, but also the results of self-reported practices indicated less risky behavior for "Precautious consumers" compared to "Unconcerned consumers" (Table 5). In line with their opinion that the expiration date of the food products is important for food safety, "Precautious consumers" significantly more often checked the expiration date of RTE foods during purchasing and before food consumption, compared to "Unconcerned consumers" ($p<0.05$, Table 5). As the consumers are seen as the final line of the defense against foodborne outbreaks, it is important to assure that cross contamination between RTE and raw foods is prevented, and that household refrigerators are clean and operating at correct temperature (Jackson et al. 2007; Vegara et al. 2014). The results obtained in this study have indicated that "Precautious consumers" declared that they more often checked the temperature and separated foods to prevent cross contamination in their domestic refrigerators compared to members of "Unconcerned consumers" ($p<0.05$). The overall variability of temperature in domestic refrigerators is reported to be in the range 7.0±2.7°C in Southern and 6.1±2.8°C in Northern European countries (Roccato et al. 2017). These temperatures are capable of supporting the growth of different food-borne pathogens especially for RTE foods stored for the extended period of time (Jackson et al. 2007).

When foods have bad smell, taste or appearance, it is mostly contaminated with spoilage microorganisms, while the presence of food-borne pathogens would leave no obvious sign of contamination. "Unconcerned consumers" more often judged safety of chilled RTE foods based on the appearance, smell or food taste, compared to the "Precautious consumers", although the observed difference was not statistically significant ($p>0.05$). They were not aware that color, smell or appearance of food would not give any indication of food contamination (Carbas et al. 2013; Djekic et al. 2014; Martins et al. 2012; Smigic et al. 2016).

"Precautious consumers" significantly more often than "Unconcerned consumers" have a habit of discarding RTE foods after expiration date ($p<0.05$). Practices that indicate concern of "Unconcerned consumers" are related to the

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usage of expired date RTE foods for the preparation of some cooked meals, although the overall concern towards this statement was low (Table 5). These results might be partially explained by relaxed and careless behavior of "Unconcerned consumers". Along with this, there is a general lack of understanding of terms used to define shelf-life, and consumers do not usually understand and often misinterpret the "best before" and "use by" date (Hall-Phillips and Shah 2017; Van Boxstael et al. 2014). Foods with expired "best before" date are still safe to be eaten, although some quality parameters have been lost. However, foods with the expired "use-by" date are considered not be suitable for the consumption, due to increased risk of food-borne illnesses. Therefore, consumers who do not adequately understand information given on the food label are more prone to take risky actions at their own households. As already mentioned, the obligation to provide shelf-life and storage instruction is only applicable for pre-packaged chilled RTE foods, while there is no obligation for such information for cut-to-order foods. This leaves consumers such as "Unconcerned consumers" to be even more self-reliant, which is also riskier in terms of foodborne illnesses.

5. **This study has included consumers from nine different countries that were selected by convenience. However, including northern European countries or countries from other continents will widen the complete picture. Limitation of this study is mainly related to variable number of participants obtained from each country, leading to different representations, although the overall number of participant was high. Also, practices towards RTE foods have been only assessed from the perspective of the consumers themselves, which might differ from their actual behavior at home. Finally, it would be interesting to investigate the influence of the income level on their preference towards purchasing of pre-packed or cut-to-order, having in mind the fact that the former is more expensive variant of a product. It should be taken into account that participants from countries included in this study may have different financial status, cultural settings, family customs, purchase habits, and many other sociological factors which might influence the data obtained.Conclusion**

The current study contributes to the literature covering consumers of chilled RTE foods by showing how their habits towards place of buying and form of RTE foods, as well as country of origin effectively discriminate between consumers segments. Obtained results allow better understating of what characterize RTE foods consumers in different countries. The participants in this study could be grouped in two clusters. First cluster was characterized by the orientation towards pre-packed RTE foods, with consumers mainly coming from Bosnia and Herzegovina, India, Poland, Portugal, Spain, and Turkey. Their attitudes and self-reported practices may be categorized as less risky in terms of food-borne illnesses connected with the consumption of RTE foods. Second cluster included consumers preferring freshly cutting and slicing RTE foods, usually sold at the delicatessen department in a supermarket or at the open market. They are mostly consumers coming from Croatia, Serbia and Slovenia. Results of this study clearly showed that their attitudes and self-reported practices might be considered more risky.

The obtained results from the study might be exploited threefold. Firstly, it is important to raise the level of awareness of all consumers, and most specifically of "Unconcerned consumers", using easily assessable advertisements/leaflets related to chilled RTE foods. Awareness-raising campaigns distributed through social networks might have significant contribution to improving their home practices and consequently reducing risk. In addition to this, it is of ultimate importance to increase consumers' understanding of food labels, as they often do not understand it, or do not necessary follow instructions related to recommended time and temperature of storage. Secondly, along with the increased awareness of all consumers, it is also needed to facilitate and improve messages that come from the food producers and are directed towards consumers. Undoubtedly, inconsistencies or lack of adequate instructions to be applied at home settings might result in consumers' ignorance of given information and activities that will be based solely on the personal beliefs and principles. In that sense, simple, uniform and targeted food labels can certainly make consumers easier to accept and consequently to follow particular instructions. Finally, it is important to emphases the role of retailers who are cutting and slicing RTE foods for individual consumers. Their role is very important to ensuring the safety of foods, as they operate in conditions of increased risk of contamination, which can be further transferred to foods sold to the consumers. Due to the lack of instructions regarding time and storage conditions of cut-to-order RTE foods, retailers must ensure that their customers are informed in any way about how to safely store these foods at home. Although the risk of contamination and the possibility of pathogen growth/survival are dependent

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on the food product itself, it is important to establish some minimum conditions that are common to different products and easily acceptable to different consumers. It is important to prevent situation in which consumers are left without adequate information how to handle RTE foods at their homes.

This research was conducted in different countries of the world, which are geographical dislocated. Consumers from these countries show substantial differences in diet, food products they buy, place of buying them and the way they consume them. Nevertheless, common shortcomings and difficulties were identified, and might be utilized for setting the recommendations at the multinational level.

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CRediT authorship contribution statement

Nada Smigic: Conceptualization, Investigation, Methodology, Visualization, Writing – original draft; Sibel Ozilgen: Writing – review & editing; Vicente M. Gómez-López: Writing – review & editing; Sandra Maria Osés: Writing – review & editing; Zorana Miloradovic: Investigation, Methodology, Visualization, Writing – review & editing, Biljana Aleksic: Writing – review & editing; Jelena Miocinovic: Writing – review & editing; Sonja Smole-Mozina: Writing – review & editing; Ajda Kunčič: Writing – review & editing; Raquel Guiné: Writing – review & editing; João Carlos Gonçalves: Writing – review & editing; Joanna Trafiałek: Writing – review & editing; Ewa Czarniecka-Skubina: Writing – review & editing; Gunjan Goel: Writing – review & editing; Marijana Blazic: Writing – review & editing; Dora Herljevic: Writing – review & editing; Aleksandra Nikolić: Writing – review & editing; Alen Mujčinović: Writing – review & editing; Ilija Djekic: Investigation, Methodology, Visualization, Writing – review & editing

Declaration of competing interest

Declarations of interest: none.

TABLES CAPTION

Table 1. Demographic composition of participants (n=2723)

Table 2. Demographic characteristics of participants distributed among two clusters.

Table 3. Distribution of participants among two clusters

Table 4. Attitudes towards RTE foods distributed within the whole population and within two clusters. Values represent mean values (± standard deviation) of the Likert scale (1 – disagree strongly; 2 – disagree; 3 – no opinion; 4 – agree; 5 – agree strongly)

Table 5. Self-reported practices related to RTE foods within the whole population and within two clusters. Values represent mean values (± standard deviation) of the Likert scale (1 – never; 2 – rarely; 3 – sometimes; 4 – often; 5 – always)

Table 1. Smigic et al., 2022

Factor	Level	Number (n)	% of sample
Country	Bosnia and Herzegovina	449	16.5
	Croatia	353	13.0
	Poland	305	11.2
	Portugal	352	12.9
	Serbia	387	14.2
	Spain	200	7.3
	Slovenia	106	3.9
	Turkey	361	13.3
	India	210	7.7
Gender	Female	1830	67.2
	Male	875	32.1
	Prefer not to say	18	0.7
Age	Young (<20 years)	168	6.2
	Adults (21-40 years)	1222	44.9
	Middle aged (41-60 years)	849	31.2
	Old (>60 years)	484	17.8
Education	Elementary school	59	2.2
	High school	560	20.6
	Graduate	1499	55.0
	Post graduate	605	22.2
Employment	Unemployed	790	29.0
	Seasonal job	259	9.5
	Permanent job/Retired	1674	61.5
Responsible for purchasing	Yes, most of the time	1581	58.1
	Yes, sometimes	904	33.2
	No	238	8.7
Responsible for preparing	Yes, most of the time	1442	53.0
	Yes, sometimes	961	35.3
	No	320	11.8
Number of household members	1 member	241	8.9
	2-3 members	1292	47.4
	4-5 members	1020	37.5
	>5 members	170	6.2
Small child (<5 years old) living in the household	Yes	371	13.6
	No	2352	86.4
Old person (>60 years old) living in the household	Yes	1009	37.1
	No	1714	62.9
Immune-compromised person living in the household	Yes	525	19.3
	No	2198	80.7
Pregnant women living in the household	Yes	148	5.4
	No	2575	94.6
TOTAL		**2723**	**100**

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Table 2. Smigic et al., 2022

		"Precautious consumers" (n=1434)		"Unconcerned consumers" (n=1289)		Chi-Squared Test
		n	**%**	**n**	**%**	
Country	Bosnia and Herzegovina	232	**51.70%**	217	48.30%	χ^2 =231.1, df=8, p<0.05
	Croatia	130	36.80%	223	**63.20%**	
	Poland	168	**55.10%**	137	44.90%	
	Portugal	203	**57.70%**	149	42.30%	
	Serbia	112	28.90%	275	**71.10%**	
	Spain	117	**58.50%**	83	41.50%	
	Slovenia	52	49.10%	54	**50.90%**	
	Turkey	270	**74.80%**	91	25.20%	
	India	150	**71.40%**	60	28.60%	
Gender	Female	980	**53.6%**	850	46.4%	χ^2 =1.935, df=2, p<0.05
	Male	444	**50.7%**	431	49.3%	
	Prefer not to say	10	**55.6%**	8	44.4%	
Age	Young (<20 years)	111	**66.10%**	57	33.90%	χ^2=31.2, df=3, p<0.05
	Adults (21-40 years)	666	**54.50%**	556	45.50%	
	Middle aged (41-60 years)	448	**52.80%**	401	47.20%	
	Old (>60 years)	209	43.20%	275	**56.80%**	
Education	Elementary school	27	45.80%	32	**54.20%**	χ^2 =10.4, df=3, p<0.05
	High school	299	**53.40%**	261	46.60%	
	Graduate	758	**50.60%**	741	49.40%	
	Post graduate	350	**57.90%**	255	42.10%	
Employment	Unemployed	462	**58.50%**	328	41.50%	χ^2 =15.4, df=2, p<0.05
	Seasonal job	126	48.60%	133	**51.40%**	
	Permanent job/Retired	846	**50.50%**	828	49.50%	
Responsible for purchasing	Yes, most of the time	844	**53.40%**	737	46.60%	χ^2 =6.9, df=2, p<0.05
	Yes, sometimes	450	49.80%	454	**50.20%**	
	No	140	**58.80%**	98	41.20%	
Responsible for preparing	Yes, most of the time	767	**53.20%**	675	46.80%	χ^2=7.9, df=2, p<0.05
	Yes, sometimes	479	49.80%	482	**50.20%**	
	No	188	**58.80%**	132	41.30%	
Number of household members	1 member	139	**57.70%**	102	42.30%	χ^2 =6.5, df=3, p=0.088
	2 till 3 members	655	**50.70%**	637	49.30%	
	4 till 5 members	556	**54.50%**	464	45.50%	
	>5 members	84	49.40%	80	**50.60%**	
Small child (<5 years old) living in the household	Yes	184	49.60%	187	**50.40%**	χ^2 =1.6, df=1, p=0.218
	No	1250	**53.10%**	1102	46.90%	
Old person (>60 years old) living in the household	Yes	490	48.60%	519	**51.40%**	χ^2 =15.4, df=1, p<0.05
	No	944	**55.10%**	770	44.90%	
Immune-compromised person living in the household	Yes	265	**50.50%**	260	49.50%	χ^2 =1.2, df=1, p=0.285
	No	1169	**53.20%**	1029	46.80%	
Pregnant women living in the household	Yes	65	43.90%	83	**56.10%**	χ^2 =15.4, df=2, p<0.05
	No	1369	**53.20%**	1206	46.80%	

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Table 3. Smigic et al., 2022

RTE food product	Place of buying	"Precautious consumers" (n=1434)		"Unconcerned consumers" (n=1289)		Chi-Squared Test
		n	%	n	%	
Fresh cheese	Pre-packed, supermarket or specialized shop	1048	**72.50%**	398	27.50%	χ^2 =592.9, df=3, p<0.05
	Cut-to-order, supermarket delicatessen or specialized shop	143	20.50%	553	**79.50%**	
	Cut-to-order, open market/bazaar	89	28.30%	225	**71.70%**	
	I don't buy it	154	**57.70%**	113	42.30%	
White brined cheese	Pre-packed, supermarket or specialized shop	865	**73.00%**	320	27.00%	χ^2 =666.4, df=3, p<0.05
	Cut-to-order, supermarket delicatessen or specialized shop	133	17.50%	626	**82.50%**	
	Cut-to-order, open market/bazaar	83	31.90%	177	**68.10%**	
	I don't buy it	353	**68.00%**	166	32.00%	
Kajmak/ butter	Pre-packed, supermarket or specialized shop	900	**63.70%**	512	36.30%	χ^2 =362.6, df=3, p<0.05
	Cut-to-order, supermarket delicatessen or specialized shop	138	24.50%	425	**75.50%**	
	Cut-to-order, open market/bazaar	50	22.70%	170	**77.30%**	
	I don't buy it	346	**65.50%**	182	34.50%	
Sliced cheese	Pre-packed, supermarket or specialized shop	1052	**82.00%**	231	18.00%	χ^2 =1235.4, df=3, p<0.05
	Cut-to-order, supermarket delicatessen or specialized shop	137	13.70%	863	**86.30%**	
	Cut-to-order, open market/bazaar	13	9.20%	129	**90.80%**	
	I don't buy it	232	**77.90%**	66	22.10%	
Sliced cooked ham	Pre-packed, supermarket or specialized shop	978	**91.20%**	94	8.80%	χ^2 =1688.4, df=3, p<0.05
	Cut-to-order, supermarket delicatessen or specialized shop	115	10.00%	1032	**90.00%**	
	Cut-to-order, open market/bazaar	9	9.20%	89	**90.80%**	
	I don't buy it	332	**81.80%**	74	18.20%	
Sliced fermented ham	Pre-packed, supermarket or specialized shop	923	**92.00%**	80	8.00%	χ^2 =1693.4, df=3, p<0.05
	Cut-to-order, supermarket delicatessen or specialized shop	44	4.60%	917	**95.40%**	
	Cut-to-order, open market/bazaar	9	7.90%	105	**92.10%**	
	I don't buy it	458	**71.00%**	187	29.00%	
Sliced dried ham	Pre-packed, supermarket or specialized shop	947	**94.30%**	57	5.70%	χ^2 =1814.5, df=3, p<0.05
	Cut-to-order, supermarket delicatessen or specialized shop	79	7.50%	975	**92.50%**	
	Cut-to-order, open market/bazaar	25	13.60%	159	**86.40%**	
	I don't buy it	383	**79.60%**	98	20.40%	
Sliced salmon	Pre-packed, supermarket or specialized shop	856	**72.90%**	319	27.10%	χ^2 =619.1, df=3, p<0.05
	Cut-to-order, supermarket delicatessen or specialized shop	58	10.50%	497	**89.50%**	
	Cut-to-order, open market/bazaar	9	16.40%	46	**83.60%**	
	I don't buy it	511	**54.50%**	427	45.50%	

Table 4. Smigic et al., 2022

Attitudes related to RTE foods	Overall (n=2723)	"Precautious consumers" (n=1434)	"Unconcerned consumers" (n=1289)
I believe that pre-packed* RTE dairy products* are safer than cut-to-order.	3.68±1.18	3.76±1.15[a]	3.59±1.21[b]
I believe that pre-packed* RTE meat products** are safer than cut-to-order.	3.41±1.27	3.48±1.26[a]	3.34±1.28[b]
I believe that is safe to purchase cut-to-order RTE dairy products* at the open market / open bazaar.	2.86±1.18	2.71±1.18[a]	3.03±1.17[b]
I believe that is safe to purchase cut-to-order RTE meat products** at the open market / open bazaar.	2.78±1.23	2.63±1.22[a]	2.96±1.22[b]
I believe that is safe to purchase cut-to-order RTE dairy products* at the delicatessen department in the supermarket.	3.68±1.00	3.55±1.05[a]	3.82±0.93[b]
I believe that is safe to purchase cut-to-order RTE meat products** at the delicatessen department in the supermarket.	3.7±1.00	3.54±1.05[a]	3.87±0.90[b]
It is important to check the expiration date of pre-packed RTE dairy and meat products, during purchasing.	4.66±0.83	4.71±0.76[a]	4.60±0.91[b]
The expiration date of pre-packed and cut-to-order RTE dairy and meat products is the same.	2.34±1.27	2.31±1.29	2.37±1.25
I know the shelf-life and storage conditions of cut-to-order RTE dairy products* from the open market / open bazaar.	2.72±1.32	2.73±1.34	2.71±1.29
I know the shelf-life and storage conditions of cut-to-order RTE meat products** from the open market / open bazaar.	2.71±1.32	2.68±1.33	2.75±1.30
I know the shelf-life and storage conditions of cut-to-order RTE dairy products* from the delicatessen department in the supermarket.	3.34±1.24	3.31±1.26	3.37±1.21
I know the shelf-life and storage conditions of cut-to-order RTE meat products** from the delicatessen department in the supermarket.	3.38±1.25	3.32±1.28[a]	3.45±1.21[b]
It is important to store pre-packed RTE products according to storage instructions to ensure that it is safe to eat.	4.57±0.77	4.59±0.76	4.55±0.78
Ensuring a refrigerator runs at ≤5°C is essential for maintaining the safety of RTE products.	3.97±1.12	4.01±1.12[a]	3.92±1.13[b]
It is essential to store different types of RTE products on separate shelves in the refrigerator to avoid contamination.	3.99±1.13	4.06±1.10[a]	3.91±1.16[b]
An unopened pre-packed sliced cooked ham, 2 days past its use-by date is still safe to eat.	2.68±1.37	2.68±1.37	2.69±1.38
An opened pre-packed sliced cooked ham is safe to eat as long as it is within the use-by date.	2.98±1.35	2.92±1.37[a]	3.05±1.32[b]
Cut-to-order sliced cooked ham from the supermarket delicatessen is only safe to eat for max. 2 days after purchase.	3.24±1.24	3.14±1.26[a]	3.35±1.21[b]
Sliced cooked ham out of the refrigerator is safe to eat as long as they are eaten on the same day.	3.06±1.39	3.16±1.41[a]	2.94±1.36[b]
I judge if RTE dairy products* are safe to eat based on the smell, taste or appearance.	3.63±1.25	3.57±1.28[a]	3.69±1.21[b]
I judge if RTE meat products** are safe to eat based on the smell, taste or appearance.	3.54±1.27	3.47±1.31[a]	3.63±1.22[b]
It is better to discard RTE dairy* and meat** after expiration date than to risk eating unsafe food.	4.38±1.00	4.38±1.01	4.38±0.99

[a,b] Values within a row with identical letters were significantly different ($p<0.05$), as determined by Mann Whitney U test;
*Examples of RTE dairy products are fresh cheese, white brined cheese, kajmak/butter;
**Examples of RTE meat products are sliced cooked, fermented or dried meat products.

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Table 5. Self-reported practices related to RTE foods within the whole population and within two clusters. Values represent mean values (± standard deviation) of the Likert scale (1 – never; 2 – rarely; 3 – sometimes; 4 – often; 5 – always)

Self-reported practices related to RTE foods	Overall (n=2723)	"Precautious consumers" (n=1434)	"Unconcerned consumers" (n=1289)
When purchasing, I check the expiration date of pre-packed RTE dairy products*.	4.58±0.85	4.61±0.83[a]	4.55±0.86[b]
When purchasing, I check the expiration date of pre-packed RTE meat products**.	4.50±0.94	4.52±0.96	4.48±0.91
I ask the seller at the open market / open bazaar, how to safely store white brined cheese at home.	2.71±1.55	2.77±1.58[a]	2.64±1.52[b]
I ask the seller at the open market / open bazaar, for how long I can safely store fresh cheese at home.	2.69±1.55	2.74±1.57	2.63±1.52
Immediately after purchasing, I put RTE dairy and meat products in the refrigerator.	4.68±0.78	4.70±0.77	4.66±0.78
I regularly measure the temperature in my refrigerator at home.	2.78±1.46	2.88±1.48[a]	2.68±1.43[b]
In my home refrigerator, RTE meat and dairy products are placed on separate shelves from fresh fruits / vegetables.	3.99±1.23	4.15±1.18[a]	3.80±1.26[b]
Before eating, I analyze the expiration date of pre-packed RTE dairy products*.	4.29±1.05	4.37±1.02[a]	4.20±1.08[b]
Before eating, I analyze expiration date of pre-packed RTE meat products**.	4.21±1.12	4.28±1.10[a]	4.13±1.15[b]
Before eating, I judge the safety of RTE dairy products* by appearance, taste or smell.	4.14±1.13	4.10±1.17	4.18±1.07
Before eating, I judge the safety of RTE meat products** by appearance, taste or smell.	4.09±1.19	4.03±1.26	4.16±1.11
I discard RTE dairy products* after its expiration date.	4.21±1.11	4.27±1.08[a]	4.14±1.14[b]
I discard RTE meat products** after its expiration date.	4.26±1.10	4.34±1.06[a]	4.17±1.13[b]
When RTE dairy products* expire, I use them to prepare cooked meals (cheese pies / corn pies).	2.04±1.36	1.97±1.34[a]	2.12±1.38[b]
When RTE meat products** expire, I use them to prepare cooked meals (pizza / rolls).	1.82±1.25	1.80±1.26	1.84±1.25

[a,b] Values within a row with identical letters were significantly different ($p<0.05$), as determined by Mann Whitney U test;
*Examples of RTE dairy products are fresh cheese, white brined cheese, kajmak/butter;
**Examples of RTE meat products: sliced cooked, fermented or dried meat products.

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