

Determination of the Level of Knowledge about Milk and Dairy Products of Those Food Handlers Who Are Employed at Discount Markets in Bursa

¹Mehmet Kurtulus Cem Sen and ²Kadriye Burcu Ongen

¹Department of Food Hygiene and Technology, Faculty of Veterinary Medicine,

²Department of Econometrics, Faculty of Economics and Administrative Sciences,
University of Uludag, Bursa, Turkey

Abstract: This research has been made with the aim of determining the level of knowledge of those milk handlers about milk and dairy product technologies who are employed at discount markets, on the one hand and at those markets which can be described as big neighbourhood groceries, on the other hand, being located in Bursa County and in its districts. A survey consisting of 10 questions has been made with 149 food handlers in total who were impartially appointed from different markets by means of the simple random sampling method and who participated as volunteers in the research. The employees' both gender and working period in the sector has been determined to be the independent variable. It has been established that the questions additives are added to the industrial yoghurts in order to give them thickness, The packaged milk definitely should be boiled at home and the pasteurized fresh milk is boiled and then packaged were answered correctly by the women, in comparison with the men on the gender basis with a higher percentage ($p < 0.05$). It has not been observed a significant difference between both groups with the other questions. It has been given in the high percentage, wrong answers to the questions about additives. In conclusion, it has been determined that the level of knowledge of the food handlers about milk and dairy product technologies is quite deficient.

Key words: Discount market (s), food handler (s), milk and dairy product technologies, thickness, gender

INTRODUCTION

The changing consumer profile, the change in the purchasing behaviour and habits has been extremely affecting the retail sector. As the importance attached to education in every matter increases, the number of more conscious and more selectively behaving consumers is increasing and correspondingly, the retailers are searching for different approaches. And again, correspondingly, the customer-focused retailing applications such as customer satisfaction, image making, service quality and others, to which were not given much importance in the past are becoming important (Turk, 2004). The conscious consumer has is constantly interrogating during the shopping how healthy the food that they are consuming is by searching for answers to questions such as which processes have been applied to the foods during production, how much additives and traces do they contain, how sensitive is the producer company about hygiene conditions, how suitable are machinery and equipment used by the producers for the production and how effectively are the producers inspected (Bal *et al.*, 2006). The consumers have been

informed about the products they will purchase from the food handlers (charcuterie department employees), from advertisement, communication means and their friends either directly or by testing such by themselves (Turk, 2004). The research made is revealing a quite big increase in recent years with the consumers' tendency to control the labels (Aygen, 2012; Aygun, 2007). The aim is interpreted in such way as the consumer can confirm that the purchased product is secure, hygienic and of high quality (FSAI, 2009). When controlling the label information, production and/or expiry date of that product is predominantly checked then in consecutive order, it is being tried to learn the nutritional value, the substance composition and the additives contained (Peters-Teixeira and Badrie, 2005; Sen, 2007; Bozkir, 2009). The researches conducted have shown that people have negative perceptions especially about the preserving agents. When researchers are looking at the reasons for this, the fact that the consumers do not know the roles and intended purposes neither of additives nor of preserving agents and the fact that their social-economical and cultural levels as well as their educational level is low are among the first places (Davies and Wright, 1994; Aoki *et al.*, 2010; Shim *et al.*, 2011).

Nevertheless, in several different researches, it has been revealed that a great number of consumers still do not read the label information that furthermore those who read such label information find it deficient for reasons of lack of some information concerning use and preservation and concerning the products's ingredients written on the label and find that the explanations are not clear and not understandable (Yurdagul, 1991; Albayrak, 2000; Saglik, 2003). These results are showing that conscious consumers are in search of something. In this situation, those consumers who do not get enough information are waiting to get the answers to the questions in their heads, from the food handlers employed in the markets. Those answers giving wrong information cause the consumer to be mislead during buying. This situation gives rise to serious problems such as the consumers' adoption of wrong nutrition habits. It has been established in a small number of researches in which the situation of the food handlers who have an active role in shaping the shopping trends in Turkey on the application which has been evaluated that the great part of the employees have been trained only in hygiene but that such training is insufficient and that the available information is not been used (Kayayurt, 2002; Aslan and Cakiroglu, 2004; Sen and Ongen, 2013). Notwithstanding, a research aiming at establishing the knowledge on technology and products of those food handlers working in markets has not been found.

This research has been planned to identify the level of knowledge of those food handlers that are working in the food department of discount markets and facing directly the questions of the consumers about milk and dairy product technologies.

MATERIALS AND METHODS

The 149 employees in total have been included into the scope of the survey made between September 2011 and April 2013. These research in the food department in 63 different markets in both the city and the districts of Bursa County and they were impartially appointed by means of the simple random sampling method and who participated as volunteers in the research. A survey consisting of 10 questions about information on milk and dairy product technologies has been applied to the employees. The number and percentual range of the demographic data of those employees who participated in the survey has been established. The employees' both gender and working period in the sector has been determined to be the independent variable and statistical evaluation has been made by using chi-square analysis. The data have been analyzed by means of the SPSS 16.0 Programme.

RESULTS AND DISCUSSION

It has been established that 69.8 and 30.2% of those employees who participated in the research were male and female, respectively that 85.9% of them have graduated from middle/high school that 14.1% have graduated from university and that 33.6, 48.3 and 18.1% of them have been working in this branch between 0-2 ,between 2-5 and >5 years, respectively and these employees have not got any training about milk and dairy product technology (Table 1). In the research, the right answers of the food handlers given to the survey questions are stated in Table 2.

Due to the rapid increase of both foodstuff number and varieties, the diversification of those markets that sell food products and due to the fact that these are within competition, advertisements are effective for the consumers' preferences. These preferences can create changes in the consumers' level of knowledge and in their attitudes (Kizilaslan and Kizilaslan, 2008). It has been determined that the consumers as they are buying food products are acting according to their former experiences, to informations from the family and friends, to price, to advertisements and to label information on the food package (Turk, 2004). Not only was the information on the product label found insufficient by the conscious consumers and these are acting accordingly by accepting the information obtained from the means of communication even if their truthness has not been confirmed, to be true. Some others, however are not satisfied with this information they get information during the buying from the market employees and they direct their buying behaviours according to this information. Therefore, the informations given by the food handlers working in charcuterie departments must be correct and specific.

In the research, the level of basic knowledge of those food handlers who are employed in market departments regarding pasteurized milk, long-life milk, yoghurt and cheese technology, respectively that have an important

Table 1: Distribution of demographic data of the employees

Demographical data	N	%
Gender		
Female	45	30.2
Male	104	69.8
Total	149	100.0
Working time		
2 years	50	33.6
2-5 years	72	48.3
>5 years	27	18.1
Total	149	100.0
Education level		
Intermediate	128	85.9
University	21	14.1
Total	149	100.0

Table 2: Percentual distribution of right answers given by the food handlers within the frame of the survey about product technology

Parameters	Total (n = 49)		Male (n = 104)		Female (n = 45)		Working since 2 years (n = 50)		Working since 2-5 years (n = 72)		Working >5 years (n = 27)	
	N	%	N	%	N	%	N	%	N	%	N	%
Preserving agents are harmful for the health no matter of their quantity	42	28.2	30	28.8	12	26.7	16	32.0	15	20.8	11	40.7
Swelling in cheese tins is normal	54	36.2	37	35.6	17	37.8	21	42.0	20	27.8	13	48.1
Preserving agents are added to the long-life milks	9	6.0	6	5.8	3	6.7	2	4.0	5	6.9	2	7.4
To give thickness, additives are added to the industrial yoghurts	7	4.7	2	1.9	5	11.1	3	6.0	2	2.8	2	7.4
Fresh-pasteurized milk is boiled and then packaged	34	22.8	10	9.6	24	53.3	9	18.9	23	31.9	2	7.4
Packed milks should definitely be boiled at home	9	6.0	3	2.9	6	13.3	2	4.0	6	8.3	1	3.7
Plastic packaging materials used in industrial products are carcinogenic	51	34.2	41	39.4	10	22.2	15	30.0	25	34.7	11	40.7
One of the aims of pasteurization is to preserve the nutritious value of milk	51	34.2	39	37.5	12	26.7	19	38.0	22	30.6	10	37.0
An interruption of the cold chain of the fresh milks does not affect their shelf-life	63	42.3	39	37.5	24	53.3	16	32.0	33	45.8	14	51.9
The shelf-life of the fresh milks increases or decreases depending on the quantity of preserving agents added to them	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

Table 3: The Chi-square values of the survey's questions in respect of gender and working time $p < 0.05$

Parameters	Gender		Working time	
	χ^2	p	χ^2	p
Preserving agents are harmful for our health no matter of their quantity	$\chi^2 = 0.074$	$p = 0.786$	$\chi^2 = 4.385$	$p = 0.112$
Swelling in cheese tins is normal	$\chi^2 = 0.066$	$p = 0.797$	$\chi^2 = 4.606$	$p = 0.100$
Preserving agents are added to the long-life milks	$\chi^2 = 0.045$	$p = 0.833$	$\chi^2 = 0.559$	$p = 0.756$
To give thickness, additives are added to the industrial yogurts	$\chi^2 = 5.922$	$p = 0.015^*$	$\chi^2 = 4.475$	$p = 0.107$
Fresh-pasteurized milk is boiled and then packaged	$\chi^2 = 34.086$	$p = 0.000^*$	$\chi^2 = 7.705$	$p = 0.021^*$
Packed milks should definitely be boiled at home	$\chi^2 = 6.042$	$p = 0.014^*$	$\chi^2 = 1.294$	$p = 0.524$
Plastic packaging materials used in industrial products are carcinogenic	$\chi^2 = 4.128$	$p = 0.042^*$	$\chi^2 = 0.914$	$p = 0.633$
One of the aims of pasteurization is to preserve the nutritious value of milk	$\chi^2 = 1.637$	$p = 0.201$	$\chi^2 = 0.842$	$p = 0.656$
An interruption of the cold chain of the fresh milks does not affect their shelf-life	$\chi^2 = 3.227$	$p = 0.072$	$\chi^2 = 3.551$	$p = 0.169$
The shelf-life of the fresh milks increases or decreases depending on the quantity of preserving agents added to them	$\chi^2 = 0.074$	$p = 0.786$	$\chi^2 = 4.385$	$p = 0.112$

Chi-square: n = 149; SD = 1

role in human nutrition has been evaluated. To the questions such as additives are added to the industrial yoghurts in order to give them thickness, the packaged milk definitely should be boiled at home and the pasteurized fresh milk is boiled and then packaged were answered correctly by the women in comparison with the men on the gender basis with a higher percentage ($p < 0.05$) (Table 3). It is thought that the women have given the right answers to these questions using also their cooking experience. It has been determined that the question Plastic packaging materials used in industrial products are carcinogenic, however has been answered by the men in a higher percentage ($p < 0.05$) (Table 1).

When the right answers given to the questions asked about additives and preserving agents such as preserving agents are added to the long-life milks, additives are added to the industrial yoghurts in order to give them thickness and the shelf-life of the fresh milks increases or decreases depending on the quantity of the preserving agents added to them have been evaluated, for the first two questions there has not been seen a statistically significant difference between the groups, however, it is very significant that the answers given to the first two questions are wrong on a high level and that the answer given to the third question is completely wrong (Table 2). Many surveys conducted have established that the consumers are unaware of the function, role and advantages of such additives and that many of them perceived the additives to be unhealthy and that therefore they approach them negatively (Aoki *et al.*, 2010; Shim *et al.*, 2011; Wua *et al.*, 2013). It has been stated in the researches where the approach to the food

additives have been evaluated that those consumers who have a good social-economical background and have a university degree are more conscious in this concern (Grunert, 2005; Varela and Fiszman, 2013). Also, in the research, it makes us think that very low right answer rate to those questions regarding additives is due to the intermediate education level of the employees and to the complete lack of information they have about the effects of such additives.

In many researches in which the drinking milk habits in the world and in Turkey have been evaluated, it has been stated that unpacked milk drinking rate is extremely high depending on the several factors such as educational level, socio-cultural structure and on the fact if the family members work or do not work (Green and Park, 1998; Hsu and Kao, 2001; Hatirli *et al.*, 2004). In these researches, it has been seen that a great number of the consumers believe that preserving agents are added to the packaged milks and that the unpacked milk is healthier. However, at the present time, it has been seen that the consumption of packaged milk with the masses whose income groups and education levels are increasing, has increased (Selcuk *et al.*, 2003; Stefanikova *et al.*, 2006; Akbaya and Tiryaki, 2008; Demircan *et al.*, 2011; Yayar, 2012). As it is known, unpacked milks are those milks that should definitely be boiled prior to consumption. In the society, the widespread habit of using unpacked milk brings back the habit of boiling of the milk, too. Depending on this it is thought that a great number of the survey participants have given wrong answers to the question, the packaged milks should definitely be boiled at home (Table 2).

CONCLUSION

The food handlers in the markets have an important role in the leading the consumer's buying. Therefore, the fact that the food handlers have sufficient equipment in terms of both hygiene and technological information is of great importance. The data obtained in this research have displayed that the food handlers' level of knowledge on milk and dairy product technology is extremely low. It is obvious that the training matter that has been identified to be an important deficiency of the food sector has to be given priority in order to enable the consumers to make healthier and more secure buying.

REFERENCES

- Akbaya, C. and G.Y. Tiryaki, 2008. Unpacked and packed fluid milk consumption patterns and preferences in Turkey. *Agric. Econ.*, 38: 9-20.
- Albayrak, M., 2000. A research on the measuring of the level of consciousness of the consumers about both foodstuff packaging and labeling information in Ankara County, on foodstuff purchasing places and on package preferences. Burcu Offset Print, Ankara.
- Aoki, K., J. Shen and T. Saijo, 2010. Consumer reaction to information on food additives: Evidence from an eating experiment and a field survey. *J. Econ. Behav. Org.*, 73: 433-438.
- Aslan, S. and P. Cakiroglu, 2004. Knowledge of cooks about food security and analysis of the effect of training on this subject on their information level. *J. Occup. Educ.*, 6: 133-150.
- Aygen, F.G., 2012. Attitudes and behavior of consumers related to the inspection of food labels. *J. Bus. Res.*, 3: 28-54.
- Aygun, E., 2007. The effect of the label information on adult consumers' foodstuff purchasing behaviour. Master's Thesis, Sakarya University Social Sciences Institute.
- Bal, H.S.G., Z.G. Goktolga and O. Karkacier, 2006. Study on consumer consciousness about food safety (using the example of Tokat County). *Agric. Econ. Mag.*, 12: 9-18.
- Bozkir, E., 2009. The effect of packaging information on adult consumer's food purchasing behaviour. Master's Thesis, Hacettepe University Health Sciences Institute.
- Davies, M.A.P. and L.T. Wright, 1994. The importance of labelling examined in food marketing. *Eur. J. Market.*, 28: 57-67.
- Demircan, V., M.C. Ormeci and G. Kizilyar, 2011. Comparative analysis of the packed and unpacked milk consumption behavior of the families in Isparta province of Turkey. *Suleyman Demirel Univ. Agric. Facul. Mag.*, 6: 39-47.
- FSAI, 2009. A research study into consumers' attitudes to food labeling. Food Safety Authority of Ireland, Dublin, December 2009.
- Green, G.M. and J.L. Park, 1998. New insights into supermarket promotions via scanner data analysis: The case of milk. *J. Food Distrib. Res.*, 29: 44-53.
- Grunert, K.G., 2005. Food quality and safety: Consumer perception and demand. *Eur. Rev. Agric. Econ.*, 32: 369-391.
- Hatirli, S.A., B. Ozkan and A.R. Aktas, 2004. Factors affecting fluid milk purchasing sources in Turkey. *Food Qual. Prefer.*, 15: 509-515.
- Hsu, J.L. and J.S. Kao, 2001. Factors affecting consumers' fluid milk purchasing patterns in Taiwan: Products comparison and marketing implications. *J. Food Prod. Market.*, 7: 41-51.
- Kayayurt, Y., 2002. Determining the food safety knowledge level of the kitchen staff working for 4 and 5 star hotel kitchens. Master's Thesis, Institute of Educational Sciences, Gazi University, Ankara, Turkey.
- Kizilaslan, N. and H. Kizilaslan, 2008. The level of knowledge and the attitudes of the consumers regarding those foodstuffs purchased by them (using the example of Tokat County). *Uludag Univ. J. Agric. Facult.*, 2: 67-74.
- Peters-Teixeira, A. and N. Badrie, 2005. Consumers perception of food packaging in Trinidad, West Indies and its related impact on food choices. *Int. J. Consumer Stud.*, 29: 508-514.
- Saglik, E., 2003. The importance of labels on foodstuffs in retail sale, their impacts on the consumers and a field research on the scale of Erzurum. Master's Thesis, Ataturk University Social Sciences Institute Business Administration.
- Selcuk, S., Z. Tarakci, K. Sahin and H. Coskun, 2003. Dairy product consumption habits of students of Magazine Centenary University. *Centenary Univ. Agric. Facult. J. Agric. Sci.*, 13: 23-31.
- Sen, M.E., 2007. Consumer attitudes towards packaging and an application. Master's Thesis, Marmara University Social Sciences Institute.
- Sen, M.K.C. and B. Ongen, 2013. Determination of hygiene-sanitation knowledge level of food handlers at food section of discount stores in Bursa. *J. Anim. Vet. Adv.* (In Press).

- Shim, S.M., S.H. Seo, Y. Lee, G.I. Moon, M.S. Kim and J.H. Park, 2011. Consumers' knowledge and safety perceptions of food additives: Evaluation on the effectiveness of transmitting information on preservatives. *Food Control*, 22: 1054-1060.
- Stefanikova, Z., L. Sevcikova, J. Jurkovicova, L. Sobotova and L. Aghova, 2006. Positive and negative trends in university students' food intake. *Bratisl Lek Listy*, 107: 217-220.
- Turk, Z., 2004. The factors effecting the consumer's behavior of purchasing and on research on private label. Master's Thesis, Social Sciences Institute Business Administration, Mugla University.
- Varela, P. and S.M. Fiszman, 2013. Exploring consumers' knowledge and perceptions of hydrocolloids used as food additives and ingredients. *Food Hydrocolloids*, 30: 477-484.
- Wua, L., Y. Zhong, L. Shan and W. Qin, 2013. Public risk perception of food additives and food scares. The case in Suzhou, China. *Appetite*, 70: 90-98.
- Yayar, R., 2012. Consumer characteristics influencing milk consumption preference. The Turkey case. *Theor. Appl. Econom.*, 19: 25-42.
- Yurdagul, M., 1991. The knowledge of the consumers regarding food additives and the related applications. *J. Nutr. Diet Magaz.*, 20: 199-208.