

Evaluating Food Quality Attributes in Table and Delivery Services in Fast Food Operations

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ABSTRACT

Fast food restaurants depend on the 'in-premise' customers as well as the 'off-premise' customers. Assumably they offer the same food products for both, at the same quality standard, however some home delivery service customers, complain of low food quality that they receive at home other than that of they get in these restaurants. The aim of this study is to determine the differences in the evaluation for the sensory food quality attributes in delivery service versus table service in the fast food operations. The results of such research may explain the effect of the delivery circumstances (packaging, delivery times, delivery periods, and quantity of items in the delivery box) on the food quality attributes. This paper is focused on changes in sensory attributes of pizza due to time lag in delivery. After investigation packing and pouch designs were changed. Possibly this can be used by all Quick Service Restaurants (QSRs) in the future.

Key Words: Food, Quality, Sensory, Temperature, Pouch

'Fast Food' Tarzı Gıda İşletmelerinde Masada ve Dışarıya Servis Durumunda Gıdaların Kalite Özelliklerinin Araştırılması

ÖZET

'Fast food' restoranlarında tüketiciler satın aldıkları ürünleri hem içeride hem de dışarıda tüketebilir. Restoranlar her iki durumda da aynı ürünleri, aynı kalite standartlarında sunarlar. Ancak eve servis isteyen bazı tüketiciler, eve gelen ürünün restoranda aldıklarından daha düşük kalitede olduğu konusunda şikayet etmektedir. Bu çalışmada amaç, fast food tarzı gıda işletmelerinde masada servis edilen ürünler ile eve servis edilen ürünlerin duyu kalite özelliklerinin belirlenmesinde farklılıkları ortaya koymaktır. Çalışma sonuçları, (paketleme, servis süresi, servis zamanı ve paket içindeki ürünlerin miktarı gibi) taşıma ile ilgili faktörlerin gıda kalite özellikleri üzerine etkisini açıklayabilir. Bu çalışma, taşımada gecikmeden dolayı pizzanın duyu özelliklerindeki değişimlere odaklanmıştır. Araştırma sonucunda paketleme ve poşetleme tasarımları değiştirilmiştir. Araştırma sonuçları gelecekte Hızlı Servis Restoranları (QSRs) tarafından kullanılabilir niteliktedir.

Anahtar Kelimeler: Gıda, Kalite, Duyusal, Sıcaklık, Poşet

INTRODUCTION

As revealed by Lane and Hartesvelt [34], Gaber [18], Powers and Barrons [46] and Abd El-Hamied [1] fast

food restaurants are the product of a long revolution dating back to the late 1940s. The simple operating format results in fast service and has earned fast food its name. Fast food is better identified as fast service or

quick service restaurants in recognition of the fact that the service is fast not the food. Ryan [49], Drysdale [14] and Shingler and Ludwick [50] and Harrington et al. [21] set menu characteristics for the QSRs, that apt to match both corporate objectives and local consumer preferences. They further defined key words for success in QSRs to encounter quality, speed, cleanliness, service and value. Whereas Brymer [9] and Canziani et al. [11] classified QSR's into segments according to their menu specialty to hamburgers, pizza, chicken, snacks, sandwich, Mexican, and seafood restaurants. Walker [55] and Betsy [6] and Gupta et al. [20] focused their classification on service layout 'on-premise or off-premise'.

According to Lobstein [36] and Hu et al. [23] many individuals prefer to eat at home, since delivery service are used by fast food restaurants to deliver food to the customers at home with or without fees, within 10 to 30 minutes post ordering. New communication technology also plays a role in speeding up fast food delivery service i.e., QSR's websites on the global net. Delivery service is in need for a separate operation system, and many companies decided to have delivery-only units, to eliminate the cost, avoid the jamming of the parking lot, and to avoid the fluctuation in the service factor. Bosley and Hardinge [7], Chaudry [12], Kilara and Lya [32], Pike [45], Regenstein and Regenstein [47], Dulen [15], Knutson [33] and Moschis et al. [38] defined the food selection criteria to be affected by the quality of sensory attributes, nutritional attributes, religious impacts, cultural impacts or budgetary limitations.

Many viewpoints are stated in reference to food quality. Bergman and Klefsjo [5] defined quality as relevant to the Latin "qualitas" meaning "of what". Minor and Cichy [37] defined quality based on consumer perception. Cardello [10] defined quality being dependant on the definition of the sensory quality. ISO 9000 define quality as a "degree to which a set of inherent characteristic fulfills requirements" [27]. Furthermore, Jelen [29], Fellows [16], Wakefield and Blodgett [56] and Njite et al. [42] elaborated that food quality attributes are divided into two main groups, sensory and hidden attributes.

Rosenthal [48] and Brown [8] indicated that shape and general appearance are extremely important in assessing food quality, since they represent the first opportunity to impress the potential buyer with the desirability of the product, and generate an initial impression of food quality. The work of Peckham and Freeland-Graves [44], Hutchings [25] and [35] focused on the importance of color in judging the quality of food since it could denote ripeness, strength of dilution, and even degree of heating.

Size is one of the important visual attributes of foods since it can together with shape contribute to the perception of "wholeness" in a product [4, 19]. Whereas Hirsch [22] Fisher and Scott [17] and Johnson and Vickers [30] explicated that consumers consider flavour -including the taste and aroma- as one of the main sensory properties that is so important and necessary in their selection, acceptance, ingestion, and enjoyment of a particular food. Cardello [10], Brown [8] and Nicola

and Roper [41] observed that smell is almost as significant as appearance when people evaluate food item for quality and desirability. Fisher and Scott [17] and Andrea and Peter [2] focused on aroma as an important sensory attribute. Szczesniak [53] and [54] work cored around texture as the sensory and functional manifestation of the structural and mechanical properties of foods and showed that consumers are becoming more texture-conscious. Moreover, the author elaborated on viscosity as "a measure of the resistance offered by a fluid to relative motion of its parts and that viscosity of some products is the most important factor to evaluate its quality, such as the different sauces, the soups, the fruit juices, and syrups. Above and beyond, Cardello [10] and Brown [8] detailed on food sound as it can play a role in evaluating their quality, like sizzling, crunching, dripping, and crackling. Dulen [15] and Kaminski et al. [31] reported that food temperature is ranked as one of the top three factors that contribute to the consumers opinion of the food quality. Temperature of food greatly affects our ability to taste since the human being sensitivity to taste is most keen between 20°C and 30°C.

Hurst et al. [24] and NRA [40] explicated that food products are susceptible to spoilage, loss of nutrients, changes in color, flavor or odor, insect/rodent infestations, and even package corrosion and leakage. Keeping quality of perishable foods, those preserved either by freezing or by refrigerating, are sensitive to its storing environmental conditions. Spiess et al. [51] and Deloitte and Touche [13] defined the factors affecting on the food quality during the storage and distribution process as follows: bacteria, molds, yeasts, enzymatic breakdown, and pests (Insects, and Rodents). Wells and Singh [57] and Namkung and Jang [39] gave details on the "shelf life" of food products as "finite times that a product remains of satisfactory quality after manufacture or retail purchase" and that foods could be categorized into three main categories according to its perishability, highly perishable foods, semi-perishable foods, and shelf-stable foods. Moreover, the reported essential strategies to apply in the food storage to keep its quality, which focus on temperature control, modified atmosphere storage, grading, packing, and other quality assurance standards, as well as inventory management and stock rotation.

The Institute of Food Technologists (IFT) [27], O'Mahony [43] and Stone and Sidel [52] defined the sensory evaluation as "a scientific discipline used to evoke, measure, analyze, and interpret reactions to those characteristics of foods and materials as they are perceived by the senses of sight, smell, taste, touch, and hearing", and explained the food evaluation types (subjective evaluation and objective evaluation). Also, both stated the objectives for any sensory evaluation. Gould [19] and Rosenthal [48] revealed that the subjective evaluation (sensory or organoleptic tests) of food quality is based on sensory characteristics and personal preferences of selected individuals, as perceived by the sense organs of the five senses. Hutchings [25], Bennion [4] and Hyldig and Green-Petersen [26] reported that there are two basic types of

subjective tests, analytical tests, and affective tests .i.e., analytical evaluation and discriminative tests.

The IFT [27] and Rosenthal [48] recommended that analysis of scaled sensory data include univariate analysis of scaled data that includes Student's t-test, analysis of variance (ANOVA), and Multiple Comparison tests, multivariate analysis of scaled data, multivariate analysis of variance (MANOVA), cluster analysis, PCA, and multi-dimensional scaling. On the other hand, Gould [19], Bennion [4] as well as Brown [8] elaborated that most of the objective tests in use have been designed to measure texture, viscosity, and colour characteristics of food. The objective evaluation tests include physical tests, chemical tests, and microscopic tests.

Beckley and Kroll [3] stated the requirements for implementing a high quality sensory evaluation, i.e., clear definition of the objectives of the sensory evaluation system, provision of a dedicated sensory testing environment, preparation and presentation of the food sample, selection of suitable test procedures, selection and training of suitable test subjects and data handling, analysis, and presentation (Validation).

MATERIALS and METHODS

Conducted in the main QSRs in Egypt (Pizza Hut, KFC, and McDonald's), four methods were applied in this research to collect the required data, evaluation form "Pilot study": aimed at re-ranking the sensory food quality attributes according to its importance for the QSRs customers, taste panels. The panels included 20 panelists in two groups (8 experts, and 12 regular customers for QSRs) The panelists evaluated the effect

of the delivery circumstances on the food quality attributes. This was done by testing the delivery in different times of the day, i.e., (mid-day, or evening period). Different delivery periods (7, 15, and 30 minutes) were also checked. Third, different numbers of items in the delivery box (single order, or the full capacity of the delivery box) was checked. Besides, in-depth personal interviews, and telephone calls: focused on exploring the factors that affect the evaluation of delivery products in QSRs. Fourth, personal observations were also gathered by the researcher.

Statistical analysis consists of percentages and weighted average methods for the gathered data from the evaluation form "pilot study", and illustrated by charts, while the laboratory examination "taste panels" data analysis was done using the cross- tabs, means analysis, correlations tests, independent samples t-tests, paired samples t-tests, analysis of variance (ANOVA) tests, and multiple- comparisons tests (Scheffe), the statistical software used in the statistical analysis is SPSS/PC version 7.5.

RESULTS and DISCUSSION

Based on analysis of data gathered, it was found that there is a significant difference at level $p < 0.001$ between the males and female evaluation for the sensory quality attributes as shown in Table 1.

There is also a significant difference at the level of 0.001 in the evaluation for the food quality attributes between the married persons with children and the single or the married without children as it appears in Table 2.

Table 1. Mean test results measuring the effect of the gender on quality attributes evaluation*

| Sensory food Quality Attributes | Male | | | Female | | |
|---------------------------------|-------|-----------|------|--------|-----------|-------|
| | Means | Quality % | Loss | Means | Quality % | Loss |
| Shape & General Appearance | 3.33 | 66.6 | 33.4 | 3.80 | 76.0 | 224.0 |
| Flavor "Taste, Odor" | 3.11 | 62.2 | 37.8 | 3.40 | 68.0 | 32.0 |
| Temperature | 2.88 | 57.6 | 42.4 | 3.10 | 62.0 | 38.0 |
| Color | 3.13 | 62.6 | 37.4 | 3.63 | 72.6 | 27.4 |
| Texture | 3.04 | 60.8 | 39.2 | 3.39 | 67.8 | 32.2 |
| General Acceptability | 3.07 | 61.4 | 38.6 | 3.42 | 68.4 | 31.6 |

*Number of tasted products=1440

Table 2. Mean test results measuring the effect of marital status on quality attributes evaluation*

| Sensory food Quality Attributes | Single | | | Married | | | Married with kids | | |
|---------------------------------|--------|-----------|------|---------|-----------|------|-------------------|-----------|------|
| | Mean | Quality % | Loss | Mean | Quality % | Loss | Mean | Quality % | Loss |
| Shape & General Appearance | 3.73 | 74.6 | 25.4 | 3.76 | 75.2 | 24.8 | 3.26 | 65.2 | 34.8 |
| Flavor "Taste, Odor" | 3.43 | 68.6 | 31.4 | 3.47 | 69.4 | 30.6 | 2.92 | 58.4 | 41.6 |
| Temperature | 3.12 | 62.4 | 37.6 | 3.15 | 63.0 | 37.0 | 2.74 | 54.8 | 45.2 |
| Color | 3.51 | 70.2 | 29.8 | 3.45 | 69.0 | 31.0 | 3.18 | 63.6 | 36.4 |
| Texture | 3.38 | 67.6 | 32.4 | 3.39 | 67.8 | 32.2 | 2.90 | 58.0 | 42.0 |
| General Acceptability | 3.42 | 68.4 | 31.6 | 3.46 | 69.2 | 30.8 | 2.91 | 58.2 | 41.8 |

*Number of tasted products=1440

Experts were able to detect the changes that occur in sensory quality attributes by the delivery circumstances more than the customers as Table 3 shows.

The loss percentage of quality attributes in the delivery service compared to the sale service is from (28.6%) for

the shape and general appearance, and increasing to (40.2%) losing percentage for the temperature, however, the general acceptability of the products in delivery service is lesser by (35.2%) than table service for the same items investigated as it appears in Table 4.

Table 3. T-test results for measuring differences in total means of sensory food quality attributes between experts and regular customers*

| Sensory Quality Attributes | Evaluation Mean | | Mean Difference | Standard Deviation | | T test | Sig. Level |
|----------------------------|-----------------|-----------|-----------------|--------------------|-----------|--------|------------|
| | Experts | Customers | | Experts | Customers | | |
| Shape & General Appearance | 3.46 | 3.64 | 0.18 | 0.91 | 0.99 | 3.640 | <0.001 |
| Flavor "Taste, Odor" | 3.19 | 3.31 | 0.12 | 0.92 | 0.95 | 2.375 | <0.05 |
| Temperature | 2.86 | 3.08 | 0.22 | 1.00 | 1.05 | 3.926 | <0.001 |
| Color | 3.06 | 3.36 | 0.30 | 0.98 | 0.96 | 1.200 | 0.230 |
| Texture | 3.06 | 3.32 | 0.26 | 0.88 | 0.97 | 5.258 | <0.001 |
| General Acceptability | 3.15 | 3.31 | 0.16 | 0.87 | 0.94 | 3.381 | <0.001 |

*Number of experts=567, number of customers=864

Table 4. Mean test results measuring the effect of delivery service on quality attributes evaluation*

| Sensory food Quality Attributes | Total | | |
|---------------------------------|-------|----------|------|
| | Means | Quality% | Loss |
| Shape & General Appearance | 3.57 | 71.4 | 28.6 |
| Flavor "Taste, Odor" | 3.26 | 65.2 | 34.8 |
| Temperature | 2.99 | 59.8 | 40.2 |
| Color | 3.38 | 67.6 | 32.4 |
| Texture | 3.04 | 64.4 | 35.6 |
| General Acceptability | 3.07 | 64.8 | 35.2 |

The shape and general appearance of the food products in the fast food restaurants is the most important attribute for the customers. Also, the flavour, followed by the temperature are primary factors that affect in the evaluation of the food quality, come next to the shape and the general appearance in the pilot study as shown in Table 5.

There is a significant difference at the level of < 0.001 in the quality attributes evaluation between the different delivery periods. The more delivery time expands, the

more food quality attributes shrink, specially in reference to temperature as revealed by Table 6.

Table 5. Ranking of food quality attributes in QSR's

| Sensory Food Quality Attribute | Weighed Average |
|--------------------------------|-----------------|
| Shape & General Appearance | 87.00 |
| Flavor "Taste, Odor" | 86.21 |
| Temperature | 80.23 |
| Color | 75.00 |
| Texture | 70.57 |

Table 6. Mean test results measuring the effect of test time on quality attributes evaluation*

| Sensory food Quality Attributes | Mid-day Period | | | Evening Period | | |
|---------------------------------|----------------|-----------|------|----------------|-----------|------|
| | Mean | Quality % | Loss | Mean | Quality % | Loss |
| Shape & General Appearance | 3.60 | 72.0 | 28.0 | 3.53 | 76.6 | 29.4 |
| Flavor "Taste, Odor" | 3.31 | 66.2 | 33.8 | 3.21 | 64.2 | 35.8 |
| Temperature | 3.06 | 61.2 | 38.8 | 2.92 | 58.4 | 41.6 |
| Color | 3.42 | 68.4 | 31.6 | 3.35 | 67.0 | 33.0 |
| Texture | 3.26 | 65.2 | 34.8 | 3.17 | 63.4 | 36.6 |
| General Acceptability | 3.26 | 65.2 | 34.8 | 3.23 | 64.6 | 35.4 |

*Number of tasted products=1440

The correlation levels differ from attribute to another toward the general acceptability, but the flavour correlation level with the general acceptability is always the highest, this means that flavour is the most correlated attribute to the general acceptability. The second attribute in correlation with the general acceptability next to the flavour depends on the nature of the product. For example, for pizza, temperature

came next to flavour, followed by texture. In McDonald's and for meat burger flavour was followed by texture and later by temperature of the product. Where as in KFC chicken products, shape and general appearance came second to flavor followed by texture. Moreover, in all cases colour has the minimum correlation level with the general acceptability. Table 7 represents these data.

Table 7. T-test and correlation test results for measuring general differences in means and correlation levels between sensory food quality attributes and general acceptability

| Sensory Food Quality Attributes | Mean± Standard Deviation | | T | | Correlation |
|---------------------------------|--------------------------|--------------------|-------|--------------------|-----------------------|
| | Score | General Acceptance | Value | Significance Level | |
| Shape & General Appearance | 3.57±0.96 | | 15.66 | <0.001 | 3.640 <0.001 Moderate |
| Flavor "Taste, Odor" | 3.26±0.94 | | 1.05 | 0.291 | 2.375 <0.05 High |
| Temperature | 2.99±1.04 | 3.24±0.91 | 12.61 | <0.001 | 3.926 <0.001 Moderate |
| Color | 3.38±0.97 | | 6.40 | <0.001 | 1.200 <0.001 Moderate |
| Texture | 3.22±0.95 | | 1.50 | 0.133 | 5.258 <0.001 Moderate |

*Number of tasted products=1440

CONCLUSION

Based on the results of both the desk and field studies, the recommendations were redesigning delivery cartoon boxes, and the holding pouches properly so as to keep the sensory quality attributes (especially, the temperature) at an appropriate level. A new design was proposed and reviewed by industry experts and academic professionals and approved and applied by the sponsor.

Also, giving a considerable attention to the delivery time, offering the required facilities to keep the delivery time less than 10 minutes and shortening delivery time that estimated for the same destination from the mid-day period during the evening period.

Considering the difference in the products natures since not all products would be subject to the same delivery time, and circumstances. Besides, a special care must be given to the side-items (french fries, salads, drinks) specially in reference to packing material, handling during delivery. For that, the delivery vehicle must be always in a proper condition, to avoid any undesirable odours, or any delay the vehicle can be the reason for it. And thence a new design for the delivery box that avoids current heat loses problem was introduced. The proposed design was reviewed and approved by both academic bodies and the sponsoring fast food operation.

REFERENCES

- [1] Abd El-Hamied, H.H., 2001. Evaluating the Sales Promotional Tools Used in Quick Service Restaurants, Master Thesis, Faculty of Tourism & Hotel Management, Helwan University. 35-36p.
- [2] Andrea, B., and Peter, S., 2000. Exhaled odorant measurement (EXOM)-a new approach to quantify the degree of in-mouth release of food aroma compounds, *LWT-Food Science and Technology*, 33(8): 553-559.
- [3] Beckley, J.P., and Kroll, D.R., 1996. Searching for sensory research excellence, *Food Technology*, 51(2): 61-63.
- [4] Bennion, M., 1995. *Introductory Foods*, 10th ed., USA, Prentice-Hall. 8,11,22,56,87p.
- [5] Bergman, B., and Klefsjo, B., 1994. *Quality from Customer Needs to Customer Satisfaction*, Sweden, McGraw-Hill Book Company, 18,36p.
- [6] Betsy, S., 1999. Fast food goes upscale, *Restaurant & Institutions*, 109(12), 86-89p.
- [7] Bosley, G.C., and Hardinge, M. G., 1992. Seventh-day Adventists: dietary standards and concerns, (General conference of Seventh-Day Adventist, Silver Spring, MD), *Food Technology*, 46(10), 112-113p.
- [8] Brown, A., 2000. *Understanding Food Principles and Preparation*, USA, Wadsworth, 13,17,45,113p.
- [9] Brymer, R., 1995, *Hospitality Management: An Introduction to the Industry*, Dubuque, IA, Kendall Hunt, 417-422p.
- [10] Cardello, A.V., 1998. Perception of Food Quality. In Taub, I.A., and Singh, R. P., (Eds.), *Food Storage Stability*. CRC Press, 2,11,15-20p.
- [11] Canziane, B. M., Almanza, B. A., and Mckeig, M. J., 2010. Assessing the Utility of Restaurant Descriptors and Typologies for Advancing the Body of Knowledge in Restaurant Management, *CHRIE*, *ICHRIE*, 1-8p.
- [12] Chaudry, M. M., 1992. Islamic food laws: philosophical basis and practical implications, *Food Technology*, 46(10): 92, 93,104.
- [13] Deloitte and Touche, 2007. Restaurant industry operations report, "2007-2008 edition". Washington, D.C.: National Restaurant Association and Deloitte, 12p.
- [14] Drysdale, J. A., 1994. *Profitable Menu Planning*, USA, Prentice-Hall, 188-193p.
- [15] Dulen, J., 1999. Quality Control, *Restaurant & Institutions*, 109 (5): 38-42.
- [16] Fellows, P., 1988. *Food Processing Technology Principles and Practice*, Ellis Harwood, 31- 33p.
- [17] Fisher, C., and Scott, T.R., 1997. *Food Flavours Biology and Chemistry*, The Royal Society of Chemistry, 8, 99p.
- [18] Gaber, A. E., 1998. Evaluating Quality Control Systems in Fast Food Operations in Cairo, Master thesis, Faculty of Tourism & Hotel Management, Helwan University, 23-24p.
- [19] Gould, W.A., 1977. *Food Quality Assurance*, U.S.A: The AVI Publishing Company, 93-114,231p.
- [20] Gupta, S., and McLaughlin, E., and Gomez, M., 2007. Guest satisfaction and restaurant performance, *Cornell Hotels and Restaurants Quarterly*, 48(3): 284-298.
- [21] Harrington, R.J., Ottenbacher M.C., and Way K.A., 2011. QSR Choice Key restaurant attributes and the role of Gender, Age and Dinning Frequency, International CHRIE conference, *ICHRIE*, 1:11p.
- [22] Hirsch, A.R., 1990. Smell and taste: how the culinary experts compare to the rest of us, *Food Technology*, 44(9): 96-100.
- [23] Hu, S. M., Leong, J. K., Kim, W.G., Ryan, B., and Warde, W.D., 2008. Senior citizens' perceived service levels in three restaurant sectors, *Journal of Foodservice Business Research*, 11(2): 202-219.
- [24] Hurst, W.C., Reynolds, A. E., Schuler, G. A., and Christian, J. A., 1993. *Maintaining Food Quality in Storage*, USA: The University of Georgia, College of Agricultural and Environmental Sciences, 3-18p.
- [25] Hutchings, J.B., 1994, *Food Color and Appearance*, Blackie Academic and Professional, 14,15p.
- [26] Hyldig, G., and Green-Petersen, D.M.P., 2004, Quality index method-an objective tool for determination of sensory quality, *Journal of Aquatic Food Product Technology*, 13(4): 71-80.
- [27] IFT, 1981. Institute of Food Technologists, Sensory Evaluation Division, *Sensory evaluation guide for testing food and beverage products*, *Food Technology*, 35(11): 50-59.
- [28] ISO, 2008. ISO 9000 series update report.
- [29] Jelen, P., 1985. *Introduction to Food Processing*, USA, Prentice-Hall. 59-62p.
- [30] Johnson, J., and Vickers, Z., 2003. Effect of flavor and macronutrient composition of food servings on

- liking, hunger and subsequent intake, *Appetite*, 31(1): 25-39.
- [31] Kaminski, L.C., Henderson, S. A., and Drewnowski, A., 2000. Young women's food preferences and taste responsiveness, *Psychology and Behavior*, 68(6): 691-697.
- [32] Kilara, A., and Lya, K. K., 1992. Food and Dietary Habits of the Hindu, *Food Technology*, 46(10): 94-103.
- [33] Knutson, B., 2000. College students and fast food: how students perceive restaurant brands. *Cornell Hotels and Restaurants Quarterly*, 41(3): 68-74.
- [34] Lane, H. E., and Hartesvelt, M. V., 1983. *Essentials of Hospitality Administration*, Reston Publishing Company, 255-267p.
- [35] Lawrence, L., Garber, Jr., Eva M. H., and Richard G. S. Jr., 2000. The effects of food color on perceived flavor, *Journal of Marketing Theory and Practice*, 8(4): 59-72.
- [36] Lobstein, T., 1988. *Fast Food Facts*, London: Camden Press Ltd. 66,72p.
- [37] Minor, L.J., and Cichy, R.F., 1984. *Food Service Systems Management*, USA, The Avi publishing company, 38, 246-248p.
- [38] Moschis, G., Folkman Curasi, C., and Bellenger, D., 2003. Restaurant-selection preferences of mature consumers, *Cornell Hotels and Restaurants Quarterly*, 44(4): 51-60.
- [39] Namkung, Y., and Jang, S., 2007. Does food quality really matter in restaurants? Its impact on customer satisfaction and behavioral intentions, *Journal of Hospitality and Tourism Research*, 31(3): 387-410.
- [40] NRA, 2010. National Restaurant Association Report, Retrieved 12/10/2009 from <http://www.restaurant.org/> (last accessed 09/01/2012).
- [41] Nicola, M. M., and Roper, T.J., 2002. Effects of novel color and smell on the response of naive chicks towards food and water, *Animal Behavior*, 57(6): 1417-24.
- [42] Njite, D., Dunn, G., and Kim, L. H., 2008. Beyond good food: What other attributes influence consumer preferences and selection of fine dining restaurants, *Journal of Foodservice Business Research*, 11(2): 237-266.
- [43] O'Mahony, M., 1995. Sensory measurement in food science: fitting methods to goals, *Food Technology*, 49(4): 72-82.
- [44] Peckham, G. G., and Freeland-Graves, J. H., 1979. *Foundations of Food Preparation*, 4th ed. USA, Macmillan Publishing Co. pp. 78-99.
- [45] Pike, O. A., 1992. The Church of Jesus Christ of Latter-day Saints: Dietary Practices and Health, *Food Technology*, 46(10): 118-120.
- [46] Powers, T., and Barrons, C. W., 1999. *Introduction to Management in the Hospitality Industry*, 6th ed. Canada: John Wiley & Sons Inc., 70- 89p.
- [47] Regenstein, J. M., and Regenstein, C. E., 1992. The Kosher food market in the 1990s-a legal view, *Food Technology*, 46(10): 122,126.
- [48] Rosenthal, A. J., 1999. *Food Texture Measurement and Perception*, Maryland: An Aspen Publication, 30, 1, 153p.
- [49] Ryan, D. A., 1989. *Business Aspects of Catering*, 1st ed. U.K.: Longman group Ltd, 50-63p.
- [50] Shingler, G. M., and Ludwick, J. L., 1995. *The Quick Service (Fast Food) Segment*, Kendall/Hunt Publishing Company. 417-422p / CIF, Parsa, H. G., and Khan, M. A., 1992. Trends in the Quick Service Restaurant Industry, *FIU Hospitality Review*, 18(3): 9-26p.
- [51] Spiess, W. E., Boehme, T., and Wolf, W., 1998. Quality Changes during Distribution of Deep-frozen and Chilled Foods. In I.A. Taub and R.P. Singh (Eds.), *Food Storage Stability*, 399-415p.
- [52] Stone, H., and Sidel, J., 2004. *Sensory Evaluation Practices*, Food Science and Technology Series, 121-124p.
- [53] Szczesniak, A. S., 1990. Texture is it still an overlooked food attribute, *Food Technology*, 44(9): 86-93.
- [54] Szczesniak, A. S., 2002. Texture is a sensory property, *Food Quality and Preference*, 31(4): 215-225.
- [55] Walker, J.R., 1996. *Introduction to Hospitality*, U.S.A.: Prentice-Hall, 167-178p.
- [56] Wakefield, K.L., and Blodgett, J.G., 1999. Customer response to intangible and tangible service factors. *Psychology and Marketing*, 16(1): 51-68.
- [57] Wells, J.H., and Singh, R.P., 1998. Quality Management during Storage and Distribution. In I.A. Taub and R.P. Singh (Eds.), *Food Storage Stability*, CRC Press, 369-378p.