Review and Prioritization of Various Advertisement Methods by Meat Products Matrix Analytic Hierarchy Method (AHP): A Case Study of Sausages Products

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Abstract

Advertising is not only as a tool to increase company sales. Fast development of mass communication tools and added new mediums to advertising media have been introduced the advertising as a key element in the success or failure of a company. Due to the intense competition between companies and the fast growth of markets and changes in consumer behavior, advertising is taken into consideration as a major tool to create consumer awareness of products and services. Thus, in order to choose the best advertising method for meat products (sausages and salami), comments of 500 Shiraz citizens are collected by Cochran sampling and used in data analysis by Analytical Hierarchy Process (AHP). After gathering the data, by synthesis the comments of respondents through arithmetic mean, the pairwise comparison matrix of criteria and priorities was formed to estimate the relative weights of them to achieve the goals of "the best method of advertising". The results indicated with respect to citizen viewpoints, the media advertisement, the street billboards, the advertising brochures, the advertising kiosks, and the purchase awards have the highest degree of importance with weight 0.430, 0.238, 0.139, 0.098 and 0.096, respectively. Due to the competition of different meat products factories, to make interest and encourage for purchasing a goods toward the competitor goods, it is necessary to use the persuasive advertisement.

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INTRODUCTION

Always it is clear that there was a relationship between existence and accessibility of goods and commodities. Some of the pictures that is designed on the walls of caves is related to creators of elementary objects. Thus, the advertisement in general means, was existed from ancient time and origins in social life of humans.

In past decades, the advertisement has been proposed as one of the main tools in working life of human societies. This tools must studies as a branch of science, social, cultural and communication carefully and use in economic, cultural and political activities (Doswell, 2000).

The advertising can be as a major element of contemporary culture in developing countries and industrialized countries. The advertisement is not limited to television but also is covered by other media. Radio, newspaper, magazine, urban advertising, Internet and etc. are the major advertisement media (ACCC, 2014). Today the advertising and marketing efforts are more important, then production and sales. Nowadays with respect to intense competition between companies and the rapid growth of the market and the rapid changes in consumer behaviors, the advertisement is noticed as a major tool (MEU, 2013). Due to the sensitivity of advertisement and its large cost, right consumption of the funds has a great importance. In recent years, development of mediums such as radio, TV, newspapers, internet etc., and rising the new facilities for marketing and advertisement is made the successive change in production and consumption of domestic and foreign markets and development in marketing programs and technology and advertisement (MEU, 2013). Due to the above, it is necessary to advertisement be done in a proper way such that commensurate with the expenditure, in the long term has benefit to the institution. However, financial shortage crisis and fierce competition among them in companies is increase the sensitivity to advertising costs. Also for more efficiency in advertisement, the methods of advertisement are classified to decrease the additional and improper cost. So in this paper we prioritize the different methods of advertisement to achieve the goals of marketing in production of meat products.

Many studies have been introduced of advertisement method fields and their effectiveness on other fields which are indicated to them in following. Rasoulzadeh and Hasannezhad (2013) analyzed and prioritized the effective methods of advertisement for tourist attraction using AHP model in Khorasan Razavi Province of Iran. The results illustrated the advertisement through TV, introduction the tourism attractions regions of country, introduction the beautiful place of province through trailer and billboards across the province, and introduction the tourism attractions in entrances of the city and the holy shrine has the highest importance in tourist attraction , respectively. Mohammadi and Esmaeili (2013) analyzed the priority of advertisement mediums AIDA based through AHP method in sport industrials. Results indicated that in forth level TV, third level advertisement; second level make awareness have the most importance with weigh 0.522, 0.369 and 0.437, respectively. Also results based on AIDA model indicated in forth level respect to make awareness, willing and propelling customers to purchase, the TV have the most importance with final weight 0.510, 0.496 and 0.499, respectively. Ebrahimi *et al.* (2011) investigated the effect of advertisement on tourist attraction as well as the effect of advertisement mediums which used in tourism industry in Isfahan city. Results indicated that advertisement tools used in Isfahan is not been effective to attract the international tourists and there is five methods with names guidance books, online advertisement, TV, brochure and newspaper which can be used to attract the tourists but the effect of this tools are different for various regions, genders, age and graduations. According to the Dyre *et al.* (1992) Using local advertising, word of mouth, promotions at the farmers market or the on farm stand, producers are spreading the word that home delivery is not a thing of the past. ACCC (2014) showed there are some particular obligations that apply when businesses use a number of different advertising or promotional 'techniques' to promote their products or services.

Considering the importance of advertising, this study is trying to find an optimal advertising pattern for sausages Products.

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MATERIALS AND METHODS

With respect to goal which this research follows, the decision Analytical Hierarchy Process (AHP) is known as the most appropriate method for analyze the information. AHP is the one of the famous methods for multi-criteria decision which has been introduced by Tomas L. Saaty in year 1970. The AHP is the mirror of natural behavior and human thoughts. This technique analyzes the complicated problems in regard to their interactive effects, convert them to simple form and solve them. AHP can be used when the decision operation is faced with several choice competing and criteria decision which this considered criteria can be quantitative and qualitative. This technique is based on pairwise comparisons and let the managers to investigate various scenarios (Ngai, 2002). The analytical hierarchy process with respect to its simple essence and perfect as well, is welcomed by various users and administrators. Based on this technique, each decision problem has a structure which named by hierarchy including objective levels, criteria and choices. Performing this process in each problem in based on the following stages:

1- Design the hierarchy tree: in this stage, it is required to show the decision problem graphically with goals, criteria and decision choices.

2- Pairwise comparison table: this stage includes the questionnaire which has the pairwise comparison of intended criteria. In the questionnaire has been asked each replier to compare the advertisement methods pair to pair and in the next step has been asked them to identify the priority degree of the themselves selected method from other method. In order to this, usually choice comparisons with j^{th} index with respect to j^{th} choices or indexes are used.

3- Create the pairwise comparison matrix: after the questionnaire was completed, the process on the information is performed. First, the pairwise comparison matrix is extracted. The diagonal of matrix is naturally 1. Because in pairwise comparison, the comparison between two similar alternatives will be the same. In other hand, the inverse of two alternatives comparison with together will be record fractionally.

4- Compute the weights: next step in analytical hierarchy process is the required calculation to define the priority of each decision factor using pairwise comparison matrices information. The summary of mathematical calculations are expressed as following:

Calculate the sum of numbers in each column of pairwise comparison matrix, and then divide each element of column on the sum of numbers of related column. The new matrix which is created is named by normalized comparison matrix. Then calculate the average of numbers of each row. This represents the relative weight of the decision factor through matrix rows.

5- Compute the Consistency Ratio (CR): The final stage is to calculate a Consistency Ratio (CR) to measure how consistent the judgments have been relative to large samples of purely random judgments. If the CR is much in excess of 0.1 the judgments are untrustworthy because they are too close for comfort to randomness and the exercise is valueless or must be repeated. It is easy to make a minimum number of judgments after which the rest can be calculated to enforce a perhaps unrealistically perfect consistency (Papic *et al.*, 2012).

In order to achieve the goal, the available and effective advertising methods were identified in this field using literature and documentation reviews. In the next step in order to prioritize this methods a questionnaire was provided based on hierarchy analyze technique to surveys of Shiraz citizens. The data is gathered through sampling and the sampling method was entirely random and simple. The number of samples which must be defined from society was calculated by Cochran's test as following:

$$n = \frac{N\,t^2.s^2}{N.d^2 + t^2.s^2} \qquad (1)$$

Where N, t, d, and s^2 are the population size, the t-student, the acceptable margin of error for proportion being estimated and the variance of initial sample, respectively. According to Eq. (1) when the size of population be too large, the Eq. (1) can be written as bellow briefly:

$$n = \frac{t^2.s^2}{d^2} \qquad (2)$$

Through Cochran formula the size of sample has been estimated and the result indicated that the size of sampling is equal to 500 people approximately. Random sampling method was used for data collection. Questionnaires were set up in order to compare options two-by-two, using collected data. It consists of two main parts in which individuals characteristics' and their responses to compares were gathered. Also in order to data processing and analyze the information of advertisement method prioritizing, the "Excel 2007" and "MATLAB" are used, respectively.

RESULTS AND DISCUSSION

In order to use AHP method, the decision hierarchy tree must be designed. In the first level the general goal of the hierarchy must be defined. The best selection of advertisement methods for meat production was selected as the first level of decision tree. Then in order to analyze the effectiveness of advertisement method, the following require criteria were selected:

1- Expression of the food information of sausage products.

2- Expression of the advantages and disadvantages of sausage products.

3- Expression of the require health standards.

4- More stylish packing.

5- Expression of the crop production and the factory geographical location.

In the third level of hierarchy decision tree, the different advertisement methods that are used in marketing have been placed in tree. These methods are the mediums advertisement, street billboards, advertising brochures, advertising kiosk, and purchase awards. Then the hierarchy decision tree was designed according to Figure 1. Since the AHP is used to analyze the data, at first the Consistency Ratio (CR) of the pairwise comparison related to each responder has been controlled and if the CR was acceptable (less than 0.1), the choices of responder were combined through arithmetic mean.

According to table1, among the criteria, the food information has the highest weight and the location of crop production has the lowest weight. Also among the sub-criteria, the mediums advertisement has the most important and the purchase awards have the least important. So among the advertising methods, the mediums advertisement has the first priority and street billboards, advertising brochures, advertising kiosks and purchase awards take place in next priorities.

The weight of food information criterion as well as the mediums advertisement sub-criteria is higher than other criterions and sub-criteria. This indicates the high influence of food information and mediums in people behaviors for meat products and sausage products purchase in this region. Because the TV and radio are the most effective media through history. The audiences of TV are increased daily and TV lets them to earn revenue. Also the radio with unique features such as the ability to be mobile makes the especial situations
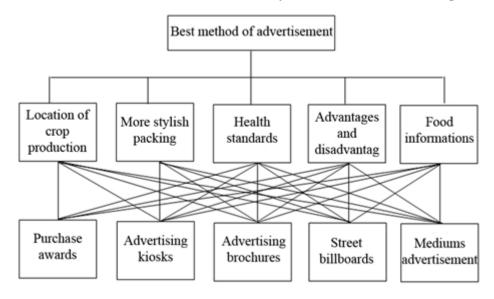

Figure 1. The hierarchy decision tree

Table1: The criteria weight of hierarchy tree

Criteria	Weight	Sub-criteria	Weight
Food Information	0.430	Mediums Advertisement	0.435
		Street Billboards	0.242
		Advertising Brochures	0.131
		Advertising Kiosks	0.091
		Purchase Awards	0.101
Advantages and Disadvantage	0.238	Mediums Advertisement	0.430
		Street Billboards	0.238
		Advertising Brochures	0.136
		Advertising Kiosks	0.098
		Purchase Awards	0.097
Health Standards	0.139	Mediums Advertisement	0.437
		Street Billboards	0.227
		Advertising Brochures	0.145
		Advertising Kiosks	0.106
		Purchase Awards	0.085
More Stylish Packing	0.098	Mediums Advertisement	0.392
		Street Billboards	0.248
		Advertising Brochures	0.161
		Advertising Kiosks	0.100
		Purchase Awards	0.099
Location of Crop Production	0.096	Mediums Advertisement	0.418
		Street Billboards	0.250
		Advertising Brochures	0.149
		Advertising Kiosks	0.088
		Purchase Awards	0.096

to create an intimate relationship with high speed between companies and audiences.

Also among all of the sub-criteria, after the mediums advertisement, the street billboards have the highest weight. This fact indicates the interaction between street billboards and growth of meat productions and sausage products purchases in this region. Unlike the radio and television, the street billboards are usually exposed for a long time and people who pass the specific locations on a daily basis, will see those frequently and this fact increases the purchase probability of production. Many buyers purchase when they have seen the advertisement severally. In fact the street billboards advertising messages communicate to the audiences frequently and involve their minds with advertisement.

The low weight of purchase awards indicate that this method has little effect on attracting customers and demand for meat products and sausage products. The disadvantage of this method is obtaining the benefits after a long

time. Because by fund allocation to purchase awards, the abuse opportunity of allocated funds is provided for dealers and also this may cause pessimistic in costumer minds if they have not won the lottery of purchase awards. Our findings support the results of Lee and Walsh (2011), Morosan (2008) and Dyre *et al*. (1992).

CONCLUSIONS

At the beginning of this research in order to identify and recognize the important criteria and prior strategies, the decision hierarchy tree was designed to indicate the problem graphically. Then the information which is obtained from 500 individuals who answer the questionnaires, have been used in two sections criteria and strategies. At first five criteria and five methods have been suggested and the respondents were been asked to estimate the importance and priority of each criterion or method in scale 1 to 9 (least importance to most importance) and evaluate the criteria and suggested methods. After gathering

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the required information and synthesize the respondent opinions, the pairwise comparison matrix of criteria importance and method priorities was formed through mathematical means to estimate the relative weight of criteria and methods, and achieve to the best method of advertisement. Results indicated that mediums advertisement has the first priority among other methods and street billboards, advertising brochures, advertising kiosks and purchase awards have the next priorities, respectively. Because TV and radio are the one of the most effective and influential mediums and the number of their audiences are increasing daily. So in regard to obtained results, we can introduce the following suggestions:

Since the most effective way to create a positive attitude in audiences toward the meat productions is mediums advertisement (TV and radio), so it is necessary that the meat production manufacturers finance more funds in this way to increase sales of the products. Also in advertisement, the main objectives must be in a way that expresses the food information, the advantage and disadvantage of products, and the required health standards. An effective advertising must introduce their products in a short time such that people have the patience to see it and also remember it easily. So due to the competition of different meat products factories, to make interest and encourage for purchasing a goods toward the competitor goods, it is necessary to use the persuasive advertisement. Therefore in this regard, in order to inform the market toward the change in volume packing, remind the purchase of products, and change in good prices, the reminder advertisement can be used.

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