



## Scientific Research

### Explaining the pattern of consumption and evaluating behavior of canned tuna buyers and consumers in Mazandaran province using the theory of planned behavior

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## ABSTRACT

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The purpose of this research was to study the buying and consumption pattern of canned tuna in Mazandaran province using the theory of planned behavior. For this purpose, after determining the research hypotheses, a suitable questionnaire was designed and completed by the statistical community. The statistical population of the research was the entire Mazandaran province that 10 cities were randomly selected for field study with a sample size of 600 people. In order to test the hypotheses and examine the intensity of the relationship between their items, an appropriate conceptual model was designed and analyzed using Lisrel software (the structural equation modeling method). According to the findings, about 60% of the households of the statistical population bought and consumed 10 to 12 cans of canned tuna every year. Brand, size 150 to 180 grams, as well as hypermarkets were among the first priorities of the statistical community regarding the three indicators of packaging characteristics, size and shopping places. The results of running the research conceptual model in two modes, standard and significant, showed that only the hypothesis of a significant effect of perceived risk on subjective norms was rejected and other hypotheses were confirmed. According to the results, among the three variables of brand, quality and packaging specifications, canned tuna brand had the greatest effect on buyers' attitudes with an impact factor of 0.52. In the following, it was found that the effect of perceived usefulness on subjective norms (0.56) is more than income (0.43). According to the findings, the price of canned tuna with an effect coefficient of 0.41, advertising and education variable with an effect coefficient of 0.32, and shopping places variable with an effect coefficient of 0.24 were significantly effective on the perceived behavior control element. Among the attitude, subjective norms and perceived behavior control elements, the most effective element on the decision to buy and consume canned tuna was attitude (with an effect coefficient of 0.47). The output of such studies will be of great help to the officials related to fisheries economy and community health, respectively, in determining appropriate strategies to increase productivity and maintain population health.

## 1-Introduction

The increase in daily worries in life and the lack of enough time to cook homemade food have made people devote a part of their table to ready meals. A variety of meat products (sausage, sausage, hamburger, ham, etc.), seafood products (canned fish, packaged fish fillets, schnitzel and fish nuggets, etc.) Purchases are found. With the passage of time and people's awareness of the harms of some meat products, their attention has been drawn towards marine products as a suitable alternative. There is also [1].

One of the seafood products that is the easiest to cook and consume and has been on people's tables for a long time is canned tuna. Canned fish industry due to its significant job creation and production of healthy and long-lasting products and easy access and its essential role in providing food security to the society, especially the middle and lower classes, and its strategic importance as reserves for military and relief centers in times of crisis, including War and natural disasters are especially important. On the one hand, this industry provides the means for the development and prosperity of the former circle, i.e., fishing, and on the other hand, by producing healthy, nutritious and nutritious products, it plays an important role in food security and providing cheap protein for the middle and lower classes of the society as the latter circle. does Therefore, the increase in the per capita consumption of this product in the country will contribute to job creation and job stability, as well as its export to foreign countries. In addition, canned fish is more nutritious and safer than other prepared foods and has all the benefits of consuming fish as a health food.

Canned tuna is currently considered one of the healthiest ready-to-eat foods in the world. Because the first ingredient of this ready-made food is fish, which is always referred to as a healthy and nutritious food; Secondly, in the production process of canned fish, no preservatives are needed due to the thermal processes (sterilization).

In developed countries, in order to increase the per capita of such foods (which increase per capita is profitable in all aspects), by using techniques related to marketing science, they evaluate and study the behavior of buyers and consumers so that they can make these foods according to With the desire of people in the society to produce, these processes ultimately result in an increase in per capita consumption [2 and 3]. Consumer behavior includes behaviors that the consumer shows before buying, during buying, and after buying a product. In other words, consumer behavior refers to a set of behaviors that a person shows when searching, buying, using, evaluating and discarding products, services and ideas that satisfy his needs [4]. In the case of aquatic animals and marine products, many such researches have been carried out in different countries, which have brought noteworthy and acceptable results [4-7].

The purpose of this research was to evaluate and study the behavior of canned tuna buyers and consumers in Mazandaran province. Understanding, identifying and evaluating consumer behavior has various benefits. This recognition is for all the production workers, marketers and those responsible for the production of the type of product, the amount of production, creating optimal changes in the product, producing a product according to all the needs of the consumer society and in one sentence, to formulate organizational and marketing strategies based on understanding and recognizing thoughts. Consumers' emotions and behavior help a lot. Other benefits of studying consumer behavior include helping managers make better decisions, providing a knowledge base of consumers for marketing researchers, helping legislators and public policy makers to establish laws related to the purchase of goods and services, helping consumers to make better decisions and understanding He pointed out the social factors affecting human behavior.

## 2- Theoretical foundations of research

One of the important theories in the field of evaluating consumer behavior is the theory of planned behavior. This theory includes the study of attitudes (the basis of psychological science) and the total of groups influencing consumer behavior. The theory of planned behavior is based on the principle that people make logical and rational decisions based on available information [8]. This theory consists of five constructs, which are attitude, mental norms, perceived behavioral control, behavioral intention and consumer behavior; which are actually its main pillars. Theory of Planned Behavior, in 1985 by Ajzen was presented and it is a cognitive model of human behavior whose main focus is on predicting and understanding well-defined behaviors. This theory provides an organized framework for predicting and explaining human behavior and is derived from the theory of reasoned action, which states that the probability of a person engaging in a specific behavior can be predicted by his intention to do that work [9] and this is the case with many empirical evidences. It has been confirmed [10]. in fact Ajzen He expanded the theory of reasoned action by introducing the perceived behavior control structure as a determining factor of behavioral intention and target behavior and explained it as the theory of planned behavior. By considering perceptions of control over performance as an additional predictor, this theory tries to predict involuntary behaviors as well. In other words, it can be said that the theory of planned behavior focuses on the perceptual determinants of behavior [11].

Any kind of expression of opinion about an object, person or an event that involves judgment and evaluation is called an attitude. In another definition, attitude refers to positive or negative feelings that a person has towards performing a behavior. More broadly, attitude means relatively stable feelings, inclinations, or sets of beliefs directed toward an idea, object, person, or situation. Regarding the purchase and

consumption of a food item, attitude refers to the different feelings that people have towards the purchase and consumption of that food item [12].

Mental norms refer to a person's understanding of the behavioral norms that people or people close to him expect to observe in certain environments. Basically, mental norms take the form of social pressure and force a person to follow certain behaviors that are expected of him. In other words, it can be said that mental norms refer to the influence of humans on the behavior and recommendations of important people in life and, in general, those around [13].

Perceived behavioral control is related to a person's understanding of the difficulty or ease of performing a behavior, as well as his perception of skills, opportunities, and resources to perform a specific behavior. This structure consists of two components. The first component is self-efficacy, which expresses a person's judgment about his abilities to perform a behavior. The second component is facilitating conditions that explain the availability of resources needed to perform a certain behavior [14].

## 3- Materials and method

### 3-1- Questionnaire design

In order to study and investigate the behavior of buyers and consumers of canned tuna in Mazandaran province, a questionnaire was designed according to the research assumptions, which has 50 questions in two sections: demographic questions (gender, age, level of education, marital status, etc.) and main questions. The main questions (Table 1) were asked based on the spectrum of five Likert options (very little with code 1, little with code 2, moderate with code 3, much with code 4 and very much with code 5). At the beginning of the questionnaire, it was stated that only buyers and consumers of canned tuna can participate in this project. In order to design questionnaire questions, similar domestic and foreign studies that evaluated the behavior of aquatic consumers (sea products) and their preferences for consumption, the points of view of university

professors, various questionnaires and library studies were used.

### 2-3- Determination of reliability (reliability)<sup>1</sup> Questionnaire

Cronbach's alpha method was used to determine the reliability of the test. For this purpose, an initial sample including 30 questionnaires was pre-tested and then using the data obtained from these questionnaires and with the help of statistical software. SPSS<sub>22</sub> The confidence coefficient was calculated by the mentioned method. This coefficient was calculated as 0.91 for the current research

questionnaire, which indicates an acceptable level of reliability for the questions asked of people.

### 3-3- Determination of credibility (validity)<sup>2</sup> Questionnaire

In order to determine the validity of the questions, confirmatory factor analysis (Lisrel software) was used and considering that the values of the factor loadings (which were more than 0.3 (0.28) for all questions) and T-value (which was recorded for all questions outside the range of -1.96 to 1.96) for all questions were obtained in the desired range, ensuring that the designed questions have an acceptable level of validity (Table 1).

**Table 1. Factor loadings and T-value for questions (confirmatory factor analysis)**

Questions	Factor loading	T-value	Questions	Factor loading	T-value
1. Attitude			8. Perceived risk		
Pleasure feeling	0.31	6.23	Harmful to health	0.35	6.76
Good feeling	0.45	7.96	It cannot guarantee health	0.49	8.34
bad feeling	0.29	5.82	Its ability to maintain health is less than expected	0.34	6.55
2. Packaging			9. Perceived behavior control		
Enter the expiration date	0.74	14.53	I will definitely buy	0.67	11.38
Design and color	0.29	5.79	I will probably buy	0.71	14.23
Size and weight	0.65	10.87	I have to buy	0.42	7.66
Brand	0.58	10.12	10. Place		
3. Brand			Fish market	0.55	9.82
Famous brand	0.71	14.18	Protein food supply stores	0.48	8.31
New brand	0.83	16.29	Online shop	0.69	11.49
Not important	0.43	7.88	Hypermarket	0.91	21.16
4. Quality			10. Price		
Texture Color	0.56	9.98	Expensive	0.29	5.69
Smell	0.85	17.73	Cheap	0.38	7.65
Taste	0.28	5.26	Average	0.36	7.54
Texture	0.29	5.81	11. Advertising & Education		
Type of processing	0.47	8.11	It is effective through the media	0.43	7.91
5. Subjective norms			It is effective in school and university.	0.57	9.99
People's opinion	0.34	6.49	Not important	0.39	7.12
Family's opinion	0.63	10.35	11. Intention		
Expert's opinion	0.94	23.46	I want to eat	0.45	7.94
Seller's opinion	0.37	6.84	I have a plan to eat	0.45	7.96
6. Perceived usefulness			Try to eat	0.73	14.33
More nutritional value than other foods	0.81	16.99	12. Final behavior		
More affordable than other food	0.75	15.43	One to three cans per year	0.31	6.24
Preventing diseases and maintaining health	0.33	6.41	Four to six cans per year	0.68	11.25
7. Income			Seven to nine cans per year	0.35	7.41
More than the purchase limit	0.27	4.89	Ten to twelve cans per year	0.75	15.61
Less than purchase limit	0.29	5.86	More than twelve cans per year	0.84	17.42
proportional to the purchase limit	0.61	9.97			

1- Reliability

2- Validity

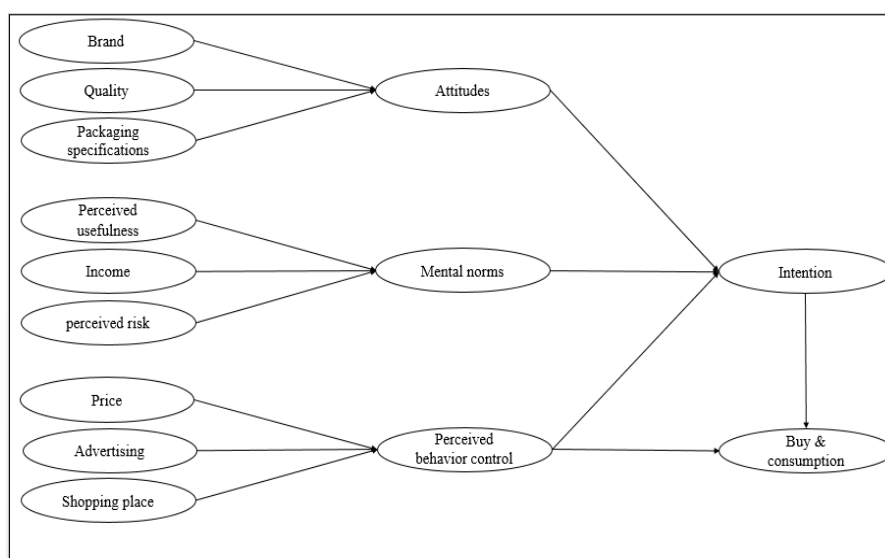
### 3-4- Research assumptions and building a conceptual model based on them

Table 2 shows the assumptions of the research. Based on these assumptions, which are derived from the theory of planned behavior, a proportional conceptual model was designed, whose diagram is shown in Figure 1. In this model, the variables of brand, quality, packaging specifications, perceived usefulness, income, perceived

risk, price, advertising and training and finally shopping places are among independent variables. Attitude variables, subjective norms, perceived behavior control, and decision to buy form the mediating variables of the model, and finally, the increase in per capita consumption (final behavior or buying and consuming canned tuna) is one of the dependent (endogenous) variables.

**Table 2. Hypothesis of research**

Number	Hypothesis
1	The brand of canned tuna has a significant effect on citizens' attitudes toward buy and consumption.
2	The quality of canned tuna has a significant effect on citizens' attitudes toward buy and consumption.
3	The packaging specification of canned tuna has a significant effect on citizens' attitudes toward buy and consumption.
4	Perceived usefulness has a significant effect on citizens' mental norms.
5	Income of citizens has a significant effect on citizens' mental norms.
6	Perceived risk has a significant effect on citizens' mental norms.
7	Price has a significant effect on citizens' perceived behavior control.
8	Advertising and education has a significant effect on citizens' perceived behavior control.
9	Shopping place has a significant effect on citizens' perceived behavior control.
10	Attitude of citizens towards canned tuna has a significant effect on intention to buy and consumption.
11	Mental norms has a significant effect on intention to buy and consumption of canned tuna.
12	Perceived behavior control has a significant effect on intention to buy and consumption of canned tuna.
13	The intention to buy and consumption of canned tuna has a significant effect on citizens' final behavior (buy and consumption of canned tuna).
14	Perceived behavior control has a significant effect on citizens' final behavior (buy and consumption of canned tuna).



**Fig 1. Diagram of conceptual model of research**

### 5-3- The statistical population of the research

The statistical population of the current research is Mazandaran province, 10 cities (Behshahr, Sari, Qaimshahr, Amol, Babolsar, Noor, Nowshahr, Chalus,

Tankabon and Ramsar) were randomly selected to conduct the field stages of the research (Table 3). Sample size through Kekran's formula<sup>3</sup> 384 people were calculated, but in order to obtain more reliable results, 600 questionnaires were

used. The number of samples in each city was calculated according to the population of that city compared to the total population.

Table 4 presents the demographic characteristics of the statistical population.

**Table 3. Statistical society of research**

City	Population size	Percentage of the total population	Sample size
Behshar	94702	8.05	48
Sari	347402	29.5	177
Qaemshahr	204953	17.4	104
Amol	237528	20.17	121
Babolsar	59966	5.1	31
Noor	26947	2.28	14
Nowshahr	49403	4.19	25
Chalus	65196	5.53	33
Tonkabon	55434	4.7	28
Ramsar	35997	3.05	19
Total	1177528	100	600

**Table 4. Socio-demographic characteristics of the sample (% respondents, n=600)**

Characteristics	Abundance	Characteristics	Abundance
<b>Gender</b>		<b>Place of birth</b>	
Male	59.6	Coastal city	92.4
Female	40.4	Non-coastal city	7.6
<b>Age</b>		<b>Household size</b>	
<20 years	6.5	Two	9.3
20-35 years	29.1	Three	23.7
35-50 years	52.8	Four	51.9
50-65 years	9.7	Five and more	15.1
65-80 years	1.9	<b>Income (Rials)</b>	
<b>Education</b>		100-150 millions	19.2
College education	80.9	150-200 millions	56.8
Diploma & less	19.1	200-250 millions	17.6
<b>Marital Status</b>		250 millions≤	6.4
Married	74.6		
Single	25.4		
<b>Job</b>			
Free	52.5		
Employee	21.6		
Student	9.1		
Unemployed	6.2		
Retired	10.6		

### 6-3- Statistical analysis

In order to perform confirmatory factor analysis, checking the acceptance or rejection of the hypotheses (at 95% confidence level) as well as the intensity of the relationship between the model structures, structural equation modeling method and Lisrel software (version 8.80) were used. In this method, the research model is in two standard modes (in order to check the effect coefficients between the model structures) and significance (to evaluate the status of assumptions and values T) was executed.

Assumptions that index values T-value For them, if it is outside the range of -1.96 to 1.96, they will be accepted and otherwise they will be rejected. Next, In order to evaluate and rank the priorities of the statistical community about some characteristics of canned tuna using Friedman's test (software SPSS<sub>22</sub>) was used.

## 4-Results

### 1-4- Purchase and consumption of canned tuna (cans) in the statistical population

Table 5 shows the purchase amount of canned tuna (cans) in the households of the

statistical population. According to this table, most households (59.6 percent) buy and consume 10 to 12 cans of canned food

every year. Also, the percentage of households that bought and consumed more than 12 cans per year was reported as 7.1%.

**Table 5. Level of consumption of canned tuna in the statistical population**

Amount of household purchases	Abundance (%)
One to three cans per year	2.4
Four to six cans per year	12.6
Seven to nine cans per year	18.2
Ten to twelve cans per year	59.6
More than twelve cans per year	7.1

#### 2-4- The priorities of the statistical community regarding packaging specifications, package size, and where to buy canned tuna

In Table 6, the priorities of the statistical community regarding packaging specifications, package size and the place to buy canned tuna are presented (ranking). According to this table, the most important factor in the case of cans (packaging) that was of interest to buyers and consumers was the product brand (ranked first and average rank 1.24). After the brand, the design and color of the can was a factor that was important according to the citizens of Mazandarani (rank 2 and average rank 2.36). The size of the can and the expiration date of the product were two other characteristics that were investigated, which ranked third and fourth in importance, respectively.

Regarding the package size, the weight of 150 to 180 grams was ranked first (first rank and average rank 1.42) and 83. The percentage of people chose this size in the first and second priorities. The sizes of 120 to 150 grams, 100 to 120 grams and more than 180 grams were placed in the second to fourth priorities respectively (Table 6).

As can be seen in Table 6, most of the studied citizens preferred hypermarkets among the different places to buy canned tuna (first rank and average rank 1.44). This place was in the first and second priorities of 83.1% of the statistical population. After hypermarkets, online markets were among the most popular places for citizens to buy canned tuna. So that about 63% of the respondents chose these places as their first and second priorities.

**Table 6. Consumer's preferences regarding packaging specifications, weight of packaging and place of purchase of canned tuna**

Options	Consumer preferences				Average score	rank	Friedman	Significance level
	1	2	3	4				
<b>1. Packaging specifications</b>								
Expiration date	6.6	9.7	30.4	53.3	3.85	4	349.18	0.001
Design and color	32.1	31.7	20.9	15.3	2.36	2		
Size (weight)	19.8	24.1	33.6	22.1	3.12	3		
Brand	41.3	34.5	14.9	8.9	1.24	1		
<b>2. Weight of packaging</b>								
100-120g	11.1	26.3	41.5	20.4	2.96	3	354.87	0.001
120-150g	29.2	32.9	23.1	14.8	2.11	2		
150-180g	53.7	29.3	16.2	0.8	1.42	1		
More than 180g	6	11.2	19.1	63.5	3.75	4		
<b>3. Place of purchase</b>								
Protein food supply stores	10.7	24.8	42.9	20.8	3.11	3	361.57	0.001
Hypermarkets	49.9	33.2	15.6	1.1	1.44	1		



Online shop	32.8	29.6	23.1	14.3	2.39	2
Fish market	6.3	12.4	17.8	63.4	3.85	4

#### 4-3- Implementation of the research model in a standard and significant mode

Figure 2 shows the implementation of the research conceptual model in two standard and meaningful modes (using Lisrel software and structural equation modeling method). According to this figure, only the hypothesis of a significant effect of the perceived risk variable on the subjective norm of the statistical community (hypothesis no. 6) was rejected and the other hypotheses of the research were confirmed (placement T-value outside the range of -1.96 to 1.96). The results of the effect coefficients between the research variables and the model constructs showed that the variables of brand, perceived usefulness, and price are the most effective factors on the constructs of attitude, mental norms, and perceived behavior control,

respectively (with effect coefficients of 0.52, 0.56, and 41. 0). In the following, it was found that among the three main constructs of the model, i.e., attitude, subjective norm, and perceived behavioral control, citizens' attitude towards buying and consuming canned tuna has the greatest effect on the decision to buy and consume this product (with an effect coefficient of 0.47). . Also, in the model implemented in the standard mode, the highest coefficient of effect was related to the significant effect of the structure of the decision to buy and consume on the structure of the final behavior (with the coefficient of 0.76). Finally, the construct of perceived behavioral control was also significantly effective with an effect coefficient of 0.25 on the structure of purchase and consumption (final behavior).

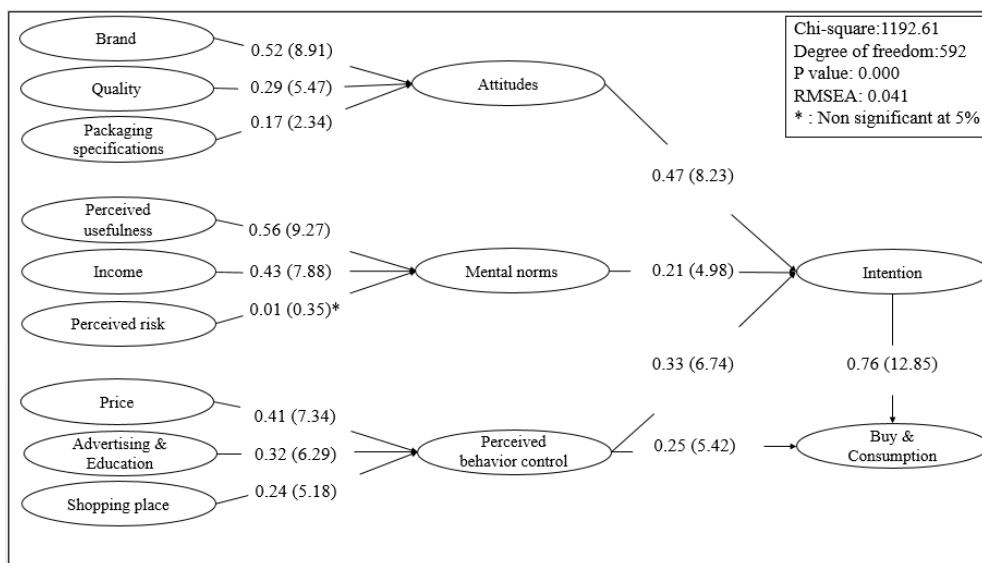


Figure 2. Running of the research model in two standard and significant modes

#### 4-4- Fit indices of the research conceptual model

Table 7 shows the fit indices of the research conceptual model. Considering that these indicators are in the standard ranges, it can

be claimed that the model has a good fit. This means that the model has a very high validity for measuring and evaluating the relationships between the investigated variables.

Table 7. The measurement of model goodness of fit index (GOFI)

Fit Index	Result	The Fit Criteria	Model Evaluation
Chi-Square/Df	2.01	Chi-Square/Df ≤ 5	Good Fit
RMSEA	0.041	RMSEA ≤ 0.08	Good Fit



CFI	0.97	$CFI \geq 0.90$	Good Fit
GFI	0.94	$GFI \geq 0.90$	Good Fit
AGFI	0.94	$AGFI \geq 0.90$	Good Fit
IFI	0.98	$IFI \geq 0.90$	Good Fit
NFI	0.92	$NFI \geq 0.90$	Good Fit
NNFI	0.91	$NNFI \geq 0.90$	Good Fit

## 5-Discussion

In the market, there are various types of fishery products, including canned fish, fish fillets, schnitzel fish, whole fish with heads and guts, fish nuggets, various types of processed shrimp, etc., and people buy each of these products according to the taste of the family. Among these products, canned tuna has more sales and importance due to its easy access, long shelf life, nutrition, convenient consumption, and has a longer history of consumption than the other mentioned products. For this reason, the present study has evaluated the purchase and consumption behavior of this product.

The results of this research showed that about 60% of the households of the studied population buy and consume 10 to 12 cans of canned food every year, which is relatively acceptable considering the low per capita consumption of aquatic and fishery products in the country. Of course, about 7% of these households experienced buying more than 12 cans per year. According to the analytical report of the Iranian Canning Industry Syndicate, the per capita consumption of canned fish in the country is about one kilogram (six or seven cans), which is compared to Canada (1.5 kg), the United States (1.8 kg), and the European Union (2.7 kg) is almost significant and has placed Iran in the fourth place in the per capita consumption of this product in the world.

The results of the implementation of the conceptual model of the research in the standard and significant mode showed that the brand variable was the most effective variable on the attitude structure (confirmation of the relevant hypothesis). In a research that evaluated the behavior of buyers and consumers of packaged shrimp in

the country, the brand name was the first and most important feature of the package that the statistical community paid attention to [1]. Research results Reyhani poul (2021) about the factors affecting the attitude of Tehrani citizens to buy and consume aquatic and fishery products also confirmed this finding [15]. Next, the ranking of the characteristics of the can showed that from the customers' point of view, the brand or brand name is very important and this characteristic was ranked first; In such a way that more than 41% of the citizens of Mazandarani placed the brand in the first priority among the four features of the can. In fact, both the implementation of the model and the prioritization of the can specifications proved the importance of the brand in selling the product. Growing competition in global markets has forced companies to differentiate themselves in using opportunities and advantages compared to competitors; For this reason, in recent years, the study of brand development has been in the center of attention. In fact, one of the levers that leads to more sales (attracting customer attention) and victory in the consumer market is the development of the brand name of the product [16]. When a brand develops and becomes widespread, customers are only looking for the same brand in shopping centers for many years. It can be said that a famous brand name is so important in selling a product and attracting the attention of customers that sometimes the quality of food is hidden behind the brand name. This was also evident in the current research and the quality variable was recorded as the second most effective variable on the society's attitude (with an effect coefficient of 0.29). Brand image or brand name plays an important role in

increasing the performance and prosperity of a company's products. This factor is an important tool in changing people's buying behavior [17].

As mentioned above, the quality variable of canned tuna after the brand was the second variable that had a significant effect on the attitude structure. This indicator in canned food is known through things such as texture color, texture type (crushed, fragmented, continuous, etc.), taste, smell, etc. Several researches confirmed the significant effect of the variable quality of aquatic products, marine products and other food on the structure of attitude [1, 5 and 18].

Canned tuna available in the market have different packages in terms of design and color (can label or label), size and weight. In this research, packaging characteristics had a significant effect on citizens' attitudes towards buying and consuming canned tuna (with an effect coefficient of 0.17). In a research that investigated the behavior of fish buyers in the west of Mazandaran province, it was also found that the characteristics of packaging can have a significant effect on the attitude of the statistical community towards the purchase and consumption of fish (packaging) [18]. Also, in a research that evaluated the role of packaging on food sales, it was found that factors such as form, design, color and material of packaging are significantly effective in increasing sales [19]. The color (label) of canned tuna cans is one of the most important aspects of packaging. It is the first symbol that attracts the consumer's attention. People's sensitivity to colors has a completely psychological nature and they indirectly affect a person's reactions and behaviors. Colors are one of the verbal signs that are known as an important element in product marketing. In the food industry, the importance of colors increases, especially when they are related to advertising or packaging, due to their role in attracting customer attention. [20]. Another aspect of the packaging (can) is its design. This dimension refers to the attractiveness of packaging and related to the existence of designs, images, combinations. Colors, signs,

symbols and graphics are placed on the can. According to studies, the tendency and attention of consumers is more directed towards products with more attractive packaging [21]. It is a suitable and effective design for cans that can win the manufacturer over competitors in all marketing processes. In such a way that this plan should quickly attract attention, intensify the interest and willingness to buy in the consumer, make people buy and finally seek the satisfaction of the customer so that it can cause continuous sales of the product. Therefore, product packaging is one of the issues that companies and manufacturers are forced to constantly control in terms of changes and competition, and if necessary, make changes in it and with new technology (which is actually a response to the needs created by consumers over time). coordinate. In order to achieve communication goals effectively and optimize packaging potential, food product manufacturers must be aware of the consumer's response and reaction to their packages and consider the consumer's perceptual processes with integrated design and in different dimensions of packaging. In the design process, marketers and packaging designers must consider the past experiences of the consumer, his needs and desires; understand how packaging design elements draw the consumer's attention to the package and the messages on the package; And broadly, to evaluate the packaging design for the effectiveness of the packages in the affairs and communication purposes [22]. In the upcoming research, the results of the ranking of packaging specifications or can features showed that the design and color were in the second place among the features of the can, and about 64% of the citizens of Mazandaran considered the design and color of the can as the first and second priorities of the purchase. These findings, along with the above-mentioned materials, confirm the great importance of the design and color of the can in the selection of canned tuna in stores. The findings related to the prioritization of different can weights confirmed that the size of 150 to 180 grams

is the first priority of the citizens (first rank). One of the factors involved in determining the priorities related to size and weight is the price and the degree of compatibility between price and size. Often, canned tuna is sold with a weight of 180 grams, but other weights are rarely produced and sold. Perhaps one of the reasons that the first priority of the statistical community is 150 to 180 grams, is that in some stores they don't have another option to buy.

According to the findings, the perceived usefulness variable was the most effective variable on the mental norms of Mazandarani citizens. This means that the people of the statistical community are aware of the nutritional value and benefits of consuming canned tuna when they accept the advice of others and experts. Also, the lack of influence of the perceived risk variable on the structure of subjective norms shows that the people of the statistical population do not take seriously the risk and insignificant risk of consuming canned tuna that is mentioned in some media.

Income was another variable affecting the mental norm of canned tuna buyers and consumers, which is completely justified and the findings are consistent with logic. Most of the researches that have been done on the marketing of aquatic and marine products pointed out this importance [23-27]. The effect of income on the subjective norm of citizens (0.43) is less than the perceived usefulness, which indicates that the society attaches special importance to the presence of aquatic animals and fishery products in the household food basket; Because they consider this product nutritious and are aware of its benefits and try to use this product with any income level.

In general, one of the most important things that people pay attention to when consuming different foods is the price of the product. Magnusson et al. (2001) believe that many consumers consider price as an important factor in determining purchase [28]. The price can be seen as the amount of benefits that consumers pay for the benefits of having or using goods or services [29]. The price of

seafood is one of the mixed factors of marketing, the perception of its scarcity (cheapness) has a serious effect on consumption. This factor is established through desirability or features that create satisfaction and is related to customers' perceptions of the features and benefits they enjoy [30]. According to the study Hawkins et al. (2004), the price factor is considered as an effective factor on the consumer's perception of the quality of various goods [31]. The results of the leading research are in accordance with the aforementioned studies and the price of canned tuna was the most effective variable on the behavior control structure perceived by the statistical population. Currently, in the market, the price of canned tuna seems to be a normal and affordable price compared to other food items. Canned tuna available in the market have different prices depending on the weight and size, type of processing and different flavors (olive oil, dill, pepper, garlic and pepper, fish beans, etc.).

In this research, advertising and education variables had a significant effect on the perceived behavior control of citizens to buy and consume canned tuna (the second effective variable on the perceived behavior control with an effect coefficient of 0.32). Advertisements are so effective in changing food trends, purchasing (consumption) decisions, and consumer behavior that various food production companies allocate a large portion of their profits to product advertisements. Advertising, if it is frequent and targeted, creates the desire to buy or use a certain food product. Education also has a role mixed with advertising. If people are taught information and materials about various types of marine products, their nutritional value, their economic value, etc. in the form of advertisements (radio, television, city and intercity billboards), this can lead people to The side of using marine products as health food is very effective. In general, regarding these products, the society does not see effective advertising (in various media) and education (in schools and universities) and this factor can be one of the

dozens of reasons why the per capita consumption of aquatic and marine products in the country is below the standard. .

With the development of places where aquatic products and their products are sold, such as canned tuna fish, depending on the characteristics of the place, such as the decor and layout, the hygiene and cleanliness of the environment, the crowding or the silence of the center, the smell and ventilation of the place of supply, the cover and cleanliness of the seller, the appropriate dealings of the seller with Customers, center management, stylish and up-to-date selling point, easy access, etc., people prefer a center or shopping place [32]. The findings of the present study showed that the place of purchase of canned tuna is significantly effective on the structure of perceived behavioral control, which is consistent with the research of Rihanipol et al. (2019) [1]. Today, marine products, including canned tuna, are sold in various places such as fish markets, protein product supply stores, online markets, hypermarkets, etc. The results of the current research confirmed that among the mentioned centers, the first rank is related to hypermarkets. Considering the old age of canned tuna (presence of this product in all hypermarkets and supermarkets) and the modernity and availability of hypermarkets, about 50% of the citizens of Mazandarani bought the product in question first from these places (Table 6). In the following, it was found that the second rank of shopping places is related to online stores, which deserves attention in its place. In these stores, all kinds of packaged seafood and canned tuna (with much more variety than other centers) are offered, and the buyer makes his purchase in just a few minutes and receives his order at home in a short time. The ease of buying and receiving products is one of the main reasons why citizens refer to these online centers. According to the findings, the third place of shopping places was related to protein product supply stores. In these stores, in addition to seafood and seafood, other protein products such as chicken, red meat,

sausages, sausages, etc. are also offered, and usually people come to these places to buy canned tuna. They also need to buy other protein products. For this reason, stores selling protein products did not have a place in the first ranks. The results of the present research showed that the aquatic supply markets are in the fourth place and the citizens of Mazandaran do not have much desire to go to these markets to buy canned tuna, so that only 6.3% of the respondents put this place as the first priority. Crowding and unpleasant smell of the environment can be among the possible reasons for this finding. Hard access can also be another possible factor in reducing the desire of citizens to these markets. Because the seafood markets, unlike hypermarkets (which exist in most parts of the city), are often located in a certain part of the city, and citizens who are far away from this point, do not have much inclination towards the mentioned markets. According to the field observation of the research team, the local fish markets in Mazandaran province are mostly places where whole and fresh fish are sold, and special attention is not paid to marine products in these places (unlike local seafood markets in non-coastal provinces and cities). The results of this research showed that the decision to buy and consume canned tuna is influenced by all three important constructs of the theory of planned behavior, i.e. attitude, subjective norms and perceived behavioral control, which is consistent with the results of other similar studies [1, 4, 5 and 7]. In the leading research, the hypothesis of a positive and significant effect of the purchase decision structure on the final behavior was confirmed, which is consistent with other researches conducted in this field and similar fields [18, 33 and 34]. The significant influence of the structure of decision to purchase and consumption on the final behavior (purchase and consumption) shows that the studied statistical community turns its decision and speech into action. In some statistical societies, the decision may not affect the final behavior, which points to

the fact that speech and decision are easier said than done.

## 6-Conclusion

The amount of canned tuna consumption in Mazandaran province, despite the proximity to the coast and the presence of fresh fish, is significant and compared to the per capita consumption of seafood (which is lower than the standard amount), it is normal and perhaps unexpected. In order to buy canned tuna in shopping malls, Mazandarani citizens pay special attention to two factors: the brand and the design and color of the can, and these two factors are very important in choosing the product on the shelves of hypermarkets (as the first priority of shopping places). Therefore, manufacturing companies should pay special attention to these factors in order to increase productivity and sustainable profit. In the following, it was proved that the brand of the product is important for the statistical population to such an extent that its effect on the attitude of the citizens is more than the quality of the product. Mazandarani

## 8-Resources

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citizens are aware of the benefits and nutritional value of canned tuna, and the small risk of consuming these products, which are sometimes recommended by experts in the media, is not serious for them. The price of canned tuna, shopping places and advertisements and education have an effect on the perceived behavior control of citizens and finally on their decision to buy. Therefore, adjusting the price, equipping hypermarkets with the most updated fishery products, especially canned tuna, educating people in schools and universities, as well as advertising this product in various media are recommended to those involved in the production of fishery products (to increase productivity) and community health managers.

## 7- Thanks and appreciation

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## تبیین الگوی مصرف و ارزیابی رفتار خریداران و مصرف‌کنندگان کنسرو ماهی تن در استان مازندران با استفاده از نظریه رفتار برنامه‌ریزی شده

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اطلاعات مقاله	چکیده
<p><b>تاریخ های مقاله :</b></p> <p>تاریخ دریافت: ۱۴۰۳/۴/۱۰</p> <p>تاریخ پذیرش: ۱۴۰۳/۶/۲۸</p>	<p>هدف تحقیق حاضر مطالعه الگوی خرید و مصرف کنسرو ماهی تن در استان مازندران با استفاده از نظریه رفتار برنامه‌ریزی شده بود. به همین منظور پس از تعیین فرضیات تحقیق، پرسشنامه‌ای متناسب طراحی و توسط جامعه آماری تکمیل شد. جامعه آماری پژوهش، کل استان مازندران بود که به صورت تصادفی ۱۰ شهر جهت مطالعه میدانی با حجم نمونه ۶۰۰ نفر انتخاب شدند. به منظور آزمون فرضیات و بررسی شدت رابطه بین گویه‌های آن‌ها، مدل مفهومی متناسب طراحی و با استفاده از نرم‌افزار لیزرل (روش مدل‌سازی معادلات ساختاری) مورد تجزیه و تحلیل قرار گرفت. مطابق یافته‌ها، حدود ۶۰ درصد خانوارهای جامعه آماری سالیانه ۱۰ تا ۱۲ عدد قوطی کنسرو ماهی تن خریداری و مصرف می‌کردند. برند، سایز ۱۵۰ تا ۱۸۰ گرم و همچنین هایپرمارکت‌ها جزو اولویت‌های اول جامعه آماری پیرامون سه شاخص ویژگی‌های بسته‌بندی، سایز و اماکن خرید بودند. نتایج اجرای مدل مفهومی پژوهش در دو حالت استاندارد و معنی‌داری نشان داد که فقط فرضیه اثرگذاری معنی‌دار ریسک درک‌شده بر هنجارهای ذهنی رد و سایر فرضیات تأیید شدند. مطابق نتایج، از بین سه متغیر برند، کیفیت و مشخصات بسته‌بندی، برند کنسرو ماهی تن با ضریب تاثیر ۰/۵۲ بیشترین اثر را بر نگرش خریداران داشت. در ادامه مشخص شد اثرگذاری سودمندی درک‌شده بر هنجارهای ذهنی (۰/۵۶) بیشتر از درآمد (۰/۴۳) است. مطابق یافته‌ها، قیمت کنسرو ماهی تن با ضریب اثر ۰/۴۱، متغیر تبلیغات و آموزش با ضریب اثر ۰/۳۲ و متغیر اماکن خرید با ضریب اثر ۰/۲۴ به صورت معنی‌داری بر سازه کنترل رفتار درک‌شده موثر بودند. از بین سازه‌های نگرش، هنجارهای ذهنی و کنترل رفتار درک‌شده، موثرترین سازه بر تصمیم به خرید و مصرف کنسرو ماهی تن، نگرش بود (با ضریب اثر ۰/۴۷). خروجی چنین مطالعاتی به مسئولین مرتبط با اقتصاد شیلاتی و سلامت جامعه به ترتیب در تعیین راهبردهای مناسب جهت افزایش بهره‌وری و حفظ سلامت جمعیت کمک شایانی خواهد کرد.</p>
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