

Tehranish Household Preference of Farmed Fish Consumption

¹A. Adeli, ²T. Hasangholipour, ³S.A. Hossaini, ⁴H. Salehi, ⁵B. Shabanpour

^{1,3,5} Faculty of Fisheries and Environment, Gorgan University of Agricultural Sciences and Natural Resources, Gorgan, Iran.

² Faculty of Management, University of Tehran, Tehran, Iran.

⁴ Iranian Fisheries Research Organization, Tehran, Iran

Abstract: During the year of 2008, 295 households of Tehran were asked to fill the questionnaire, in order to know their attitude toward farmed fishes. After evaluation and reviewing the descriptive statistics and analyzing the non-parametric data, answering to Hypothesis test in order to know the different point of views among fish price, taste, losses, non-pollution of wild fishes and farmed fishes, and effects of these parameters on purchasing, was done. As average, each households (4 people), purchase farmed-fish, 11 times per year (5.1 kg in each time in proportion of 33.2%), which fish per capita will be 5.8 kg 59% of consumers are interest in fish packing, and printing the nutrition facts on it is the highest priority, and the highest demand is for trout fish (with 60% demand). The most important factor in increasing the farmed fish consumption, is live fish selling, and decreasing the price in comparison with wild fish. Quality and freshness have the highest influence in purchasing farmed fish.

Key words: Consumer preferences, Farmed fish, Marketing, Household, Tehran

INTRODUCTION

Fish and other sea foods are one of the most important of protein resources with high nutrition facts, Sulfur amino acids, PUFA, Thiamine, Riboflavin, Niacin, A and D vitamin, Iodine, Iron, Calcium, in any diets^[23]. By consider the role of these food in human's health an 7.03 kg fish per capita in Iran (Annual Statistics of Iranian Fisheries, 2008), there is a big difference in fish per capita in comparison to 16.4 kg fish per capita in the world^[16]. Also shows 1 kg Carp fish per capita in the world^[36], meanwhile, the researches of Hushak *et al.*^[19], Musgrove^[32], Hanson *et al.*^[19], Leek *et al.*^[31], Sechena *et al.*^[37], Bose & Brown^[10], Spinks *et al.*^[38], Redkar *et al.*^[35], Quagraine *et al.*^[34] and Akpınar *et al.*^[1] show the effects on fish consumer's behavior. But, few researches in Iran about the market of fishes, specially farmed fishes, and high ranking of aquaculture, caused this research is done regarding the consumer's point of views and their preferences in the city of Tehran, as the largest center of fish consumption and the supply gravity center of fishes in Iran. In Iran, some researches for fish consumption, have been done by^[7,18,26,25,27,8,2,36,3].

The fast increasing of world population, improving the living standards and the better view of fish consumption among consumers, have caused the demands and improving fish farming, specially in

aquaculture^[5]. In 1980, merely 9% of fish production was out of aquaculture, but today this percent has been reached to 43%^[16]. In Iran, out of the total fishery production of 562000 T, 34.4% is the share of aquaculture, which it has caused that the growth of aquaculture in Iran is higher than its mean in the world. Reference to the latest statistics, among cold water fishes, Trout with 59000 T, and among warm water fishes, 4 species of Chinese carp fishes around 97000T are cultured in a vast range^[6]. Culturing the trout in the year of 2005, with 30% growth in comparison with 4past years and world growth of -1.2%, has approached the 4th ranking which is after Chili, Norway and Denmark. And at that year, has gained the 1st ranking in freshwater, in such position that, 7.1% of production of Trout in the world belongs to Iran. Table No.1 shows the production trend of different species of fishes in Iran in comparison of similar period in other countries in the world^[16].

The consumption of sea food can bring more gaining of N₆ and N₃ fatty acids and increases the ration of unsaturated fat to saturated fat (P/S), and decrease the risk of heart attack, therefore, it is so necessary to increase the sea food consumption among all people^[23]. During 40 past years up to 2005, fish consumption in Iran has had 6.8% growth rate and from 0.5 kg has reached to 6.9 kg, but in the world it has reached from 10.1 kg to 16.4 and it has had

1.2% growth rate^[16]. Although, Iran has had a noticeable growth rate, but still there is a long way to reaching the mean in the world, and it demands a careful attention to improve the consumption culture in our local market^[5]. In Iran, orientation the target of expanding the fishery is done without considering the demands and behavior of consumers of fishery, specially the specific species of farmed fish. and the only target is increasing the production the potential of Iran's fishery to improve the consumption^[5]. Hence, identifying the behavior and trend of consumers can lead us toward better strategies, more accurate planning and programming and supplying the preferred demand and gain a dynamic market^[8].

Methodology: By using library references, reviewing the questionnaires of similar researches and interviewing with some cultures, distributors and fish food processors, a questionnaire has been designed and by helping of experts and university professors and finalizing the test, its significant level was calculated 95% through validity the method of Cronbach alpha coefficient, and the number of samples was calculated 268 households through Chocran formula. The questioners were filled by helping of higher education students and graduated students, in the form of random and measurement, by asking 295 households from all 22 localities in Tehran (Population of households is 2266984). The number of 295 has been reached by considering 10 percent increase of the result of formula. Then the software of SPSS_{11.5} was used for analyzing the descriptive statistics, non-parametric deductive data and testing the theories of research (shown in table No.2).

Results: 62% of statistical samples were men.69.7% were born in the cities of Tehran province, 5.4% were born in coastal cities of Iran and 24.8% were from other cities. Most purchasers (56.2%) were not educated (Diploma and under graduated). The average of purchasing in each time is 5.1 kg, but the most abundance of purchasing, with 13.9%, is 1 kg for each time of purchasing.

Their average of times of purchasing fish is 11 times per year, but about 53.9% of them purchase less than 10 time in a year. The level of households' income, excluding the renting fee, is between 150 up to 1500 \$. The most abundance with 400 \$ income, belongs to 16.3%.

The executed researches, identified that the consumption of farmed Trout, wild fishes and farmed carps in order, are in the next preference of consuming other protein resources such as chicken, beef and mutton. Chart No.1, illustrates all types of fish consumers in statistical society. 25.8% of them never use farmed fishes.

Most Tehranish households' first purchasing of farmed fish, is because of their curiosity. Other effective parameters on their decision are shown in chart No.2.

The mean consumption of farmed fish 5.8 kg with the standard deviation of 12.04. Mean is 930 gr, hence, 5.8 kg of fish per capita of the total use of 13.3 kg, belongs to farmed fish. In this calculation, Tehranish people have 6.6 kg fish per capita, northern people who live in Tehran have 3.1 kg and other people from other provinces have 4.1 kg fish per capita. The interviewees responded the questions by yes, no, not to know and no difference replies. Table No.2 surveys the theories of research.

The results of hypothesis test of research are shown in table No.2. Based on the chart, Tehranish households believe that northern fishes (Caspian Sea) are fresher than southern fishes (Persian Gulf). They believe that farmed fishes have less losses than wild fishes. They do not know that Trout has more or less benefit than carp fish, merely they note that trout is cleaner than carp. Meanwhile, they believe that the taste of all farmed carp fishes, even Trout, are different with each other, and they preferred farmed fish. Farmed fishes have less benefit than wild fishes, so, are consumed less, and they don't believe that are cleaner than wild fishes.

Table No.3 shows purchasing motivation, general effective parameters on farmed fishes consumption, preference of purchasing different species, special effective parameter son purchasing the trout and farmed carp fishes, and required features of packing type for Tehranish households by freedman test in the significant level of 5%.

Discussion: The overall result of research and table No.4 show the growth rate of fishes rather than animal protein in Iran, and improving the awareness of fish consumers resulting of living situation in Iran. The economic and social situation and level of education, level of income, type of occupation and family situation have been caused the differences in fish consumption^[36]. Meigolinejad^[25], believes that, Social-cultural factor is the most important factor in Tehran, in fish consumption. Tehranish households, because of better access resulting of growth rate of aquaculture, less price, more healthy and belief of farmed fish cleaner than wild fish, have higher fish per capita in comparison with other cities in Iran. But northern people who live in Tehran, still believe that wild fish is better than farmed fish. Because there is a firm relation between fish consumption and coastal line^[42]. And people of central provinces, who live in Tehran, because of cultural history of less access to fish, have the least fish consumption.

Table 1: Comparing the production trend of different species of fishes in Iran with similar period in other countries of the world till 2005 (ton) (FAO, 2007)

Species	Base year	Current production of the world (ton)	Current production of the Iran (ton)	World growth rate (%)	Iran growth rate (%)	World share (%)	Iran share (%)
Common carp	1971	3043712	18349	7.6	20.2	22.1	17
Silver carp	1975	4152506	40368	8.3	35	30.1	37.3
Grass carp	1971	3904799	11009	11.4	21.4	28.3	10.2
Bighead	1971	2208678	3670	8.6	19	16	3.4
Trout	1977	486928	34760	5.5	37.1	3.5	32.1

Table 2: The test of research's hypothesis

Hypothesis	Observation Number Positive	Expected Number	df.	Chi-square Test	P-value	Result Test
To the reason of less price, farmed fish is preferred rather than wild fish	176(66.6)	66	3	245.55	<0.001	accepted
Farmed fishes have less benefit than wild fishes, so, are consumed less	179(67.8)	66	3	258	<0.001	accepted
Farmed fishes are cleaner than wild fishes	75(28.5)	65.8	3	37.3	<0.001	rejected
Caspian Sea fishes are fresher than Persian Gulf fishes	156(59.1)	66	3	165.58	<0.001	accepted
Farmed fishes have less losses than wild fishes	86(33.1)	65	3	11.848	<0.001	accepted
Trout has more benefit than Carp fishes*	96(36.2)	66	3	58.03	<0.001	accepted
Trout is cleaner than Carps fishes*	98(37.1)	66	3	64.88	<0.001	accepted
All farmed Carp fishes have the same Taste	63(23.9)	65.8	3	81.26	<0.001	rejected
All Trout have the same taste	104(39.1)	66.5	3	112.77	<0.001	rejected

* Meanwhile, Responding to this question, equal to positive response, there are people with now information.

Table 3: Study of Tehranish households' point of views about farmed fishes

Item	Variable Name	Mean Rank	Rank	df.	Fridman Test Value	P-Value
Animal	Beef	3.37	3	5	412.137	<0.001
Protein	Mutton	1.92	2	5	412.137	<0.001
Consumption	Chicken	1.87	1	5	412.137	<0.001
preference	Cold water fishes	3.9	4	5	412.137	<0.001
	Warm water fishes	5.23	6	5	412.137	<0.001
	Wild fishes	4.71	5	5	412.137	<0.001
	Interest	2.26	2	5	340.25	<0.001
Fish	Follow other consumer	5.18	6	5	340.25	<0.001
purchasing	For children growth	2.81	3	5	340.25	<0.001
motivation	Parties & Weddings	4.49	5	5	340.25	<0.001
	Using fish in national ceremonies	4.29	4	5	340.25	<0.001
	Nutrition facts	1.96	1	5	340.25	<0.001
	Publicities	5.07	4	10	244.113	<0.001
Effective	People's order	7.64	10	10	244.113	<0.001
parameters'	Physicians' advice	5.86	6	10	244.113	<0.001
views	Experts' advice	6.03	7	10	244.113	<0.001
On	Species variety	6.71	8	10	244.113	<0.001
increasing	Price decreasing	4.47	2	10	244.113	<0.001

Table 3: Continue

The	Production quality	4.75	3	10	244.113	<0.001
farmed	Live fish selling	4.4	1	10	244.113	<0.001
Fish	Packaging	5.83	5	10	244.113	<0.001
Consumption	Festivals and exhibitions	8.26	11	10	244.113	<0.001
	Subsidizing	6.98	9	10	244.113	<0.001
Effective	Fish weight	4.35	5	5	375.871	<0.001
parameters'	Location of farming	3.98	4	5	375.871	<0.001
On	Quality and Freshness	1.54	1	5	375.871	<0.001
purchasing	Packaging	3.56	3	5	375.871	<0.001
Trout	Sanitary supplying area	2.8	2	5	375.871	<0.001
	Color of meat	4.77	6	5	375.871	<0.001
	Price	3.79	2	7	255.316	<0.001
Effective	Knowing the location of farming	5.29	7	7	255.316	<0.001
parameters'	Quality and Freshness	2.24	1	7	255.316	<0.001
On	Packaging	4.73	5	7	255.316	<0.001
purchasing	Sanitary supplying area	3.8	3	7	255.316	<0.001
farmed	species	5.26	6	7	255.316	<0.001
Carp	Quality of farming	4.57	4	7	255.316	<0.001
fishes	Fish size	6.33	8	7	255.316	<0.001
	Defining nutrition facts	3.66	1	11	243.917	<0.001
	Canned	5.46	4	11	243.917	<0.001
Characteristic	Smoked	7.65	10	11	243.917	<0.001
Of	Salted	8.13	11	11	243.917	<0.001
farmed	Frozen	9.04	12	11	243.917	<0.001
Fish	Fresh	7.02	7	11	243.917	<0.001
packing	Fillet	5.15	3	11	243.917	<0.001
	Steak	4.82	2	11	243.917	<0.001
	Ready-to-cook	5.67	5	11	243.917	<0.001
	Printing the cooking recipe	7.09	8	11	243.917	<0.001
	Printing the product and expire date	6.81	6	11	243.917	<0.001
	Printing the farming method	7.52	9	11	243.917	<0.001
Preferences	Silver Carp	3.08	3	4	303.739	<0.001
of purchasing	Bighead	4.61	5	4	303.739	<0.001
farmed	Grass Carp	2.56	2	4	303.739	<0.001
Fish	Common Carp	3.2	4	4	303.739	<0.001
species	Trout	1.55	1	4	303.739	<0.001

Table 4: Comparing the share of fish consumption with other animal protein and capita growth rate in Iran in the world (FAOSTAT,2005)

		1966	2006	Growth rate (%)
World	Consumption (Kg/Capita)	10.1	16.4	1.2
	(%) Share	28.8	29.2	23.1
Iran	Consumption (Kg/Capita)	0.5	6.9	6.8
	(%) Share	3.7	18.5	52.7

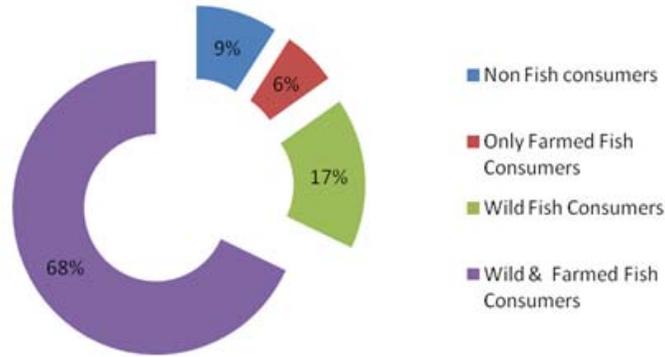


Chart 1: Categorizing all fish consumers in the statistical sample

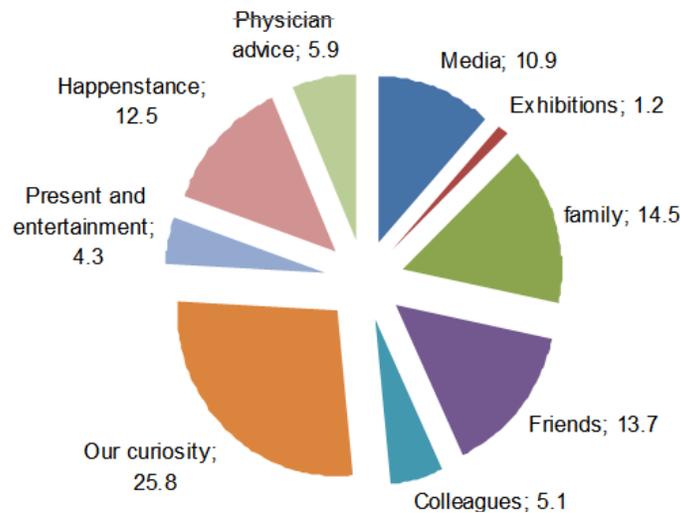


Chart 2: Effective parameters on first purchasing of farmed fish

In many countries, as average, people use fish some times in a week, and there is a big difference with Tehran, which people use fish 11 times per year. In Spain 0.62 time per week, in Belgium 0.22 time per week, in Denmark .12 time per week, in Poland 0.26 time per week and in Netherland 0.1, time per week, people consume farmed fish, and in these 5 countries, 2.5% of people never use fish, 34.4% never use wild fish and 33.6% never use farmed fish(Verbeke & Brunso,2006). In Canada and America, 37% of people use wild fish one or two times per week and 33% use farmed fish less than one time in a month (ODC, 2005), although in Tehran 25.8% never use farmed fish and 6.1% use only farmed fish, and 17.3% also use 50% farmed fish, and they purchase farmed fish 3.65

times in a year. Adeli^[5], also believes that the most important factor of fish purchasing is its protein and nutrition facts, and than because of physician's advice, as seen, still the packing and printing the nutrition facts on it is the first priority in this research. In Canada and America, 69% of people because of high nutrition facts, and 39% because of taste, use fish in their diets^[33]. As, Rostami^[27] shows that the reason of low range consumption is lack of knowledge about fish nutrition and medical facts, and also this research shows that, there is low awareness about Trout's properties and its different cleanliness in comparison with other farmed fishes, so it is required to edit the market strategies and inform the nutrition facts of different species of farmed fishes, to approach a firm

and stable aqua cultural plan. In Canada and America 41% of people believe that Farmed Salmon is less cleaner than wild fish and 33% that Farmed Salmon is less cleaner than wild fish, and about the properties differences between farmed fish and wild fish, there is 39% identical idea between for and agains groups, and 23% are not assured^[33].

The reason that Tehranish household believe that Caspian sea fishes are fresher than Persian golf fishes, is because of low awareness and their conception that Caspian sea is closer to Tehran, although, the quality of fish depends on, fishing method, preserving and storing method, transporting method and supplying method.

The reason that, people think that the losses of farmed fishes are less than wild fishes, is that, the variety of Persian Gulf wild fishes which are about 100 species with different shapes, and in contrast the 5 species of farmed fishes are so similar, and south fishes (Persian Gulf fishes) are supplied in Tehran in a vast range.

The reasons that all farmed Carp fishes, even Trout, have different tastes, are because of effective items in their quality such as: location and time of production, situation of farming pools, quality of nutrition, method and time of fishing, transportation quality and loading and supplying of fish^[8], is correct. In Canada and America, 47% of people believe a big difference between taste of farmed fish and wild fish 27% are against and 25% are not assured, and believe that there is difference between Salmons of different areas, and 21% of people purchase the Salmons of Alaska with first priority^[33].

Adeli^[6] showed that the consumption of Chinese Carp fishes has lower rating in comparison with other animal protein, and consumption of Trout has the first ranking in use because of its easy access and its freshness. Botrel^[11] also showed that, In France, Quality and freshness of Trout have gained the first preference in purchasing, and it has happened because of its live fish selling. Furthermore of higher interest to purchase fresh fish, but most productions are supplied in freezed and the supervision of quality control is week^[7], hence, standardizing the control system, improving the supervision and creating the sense of trust and vast informing and advising are the factors which can be traced by Iran Veterinary Organization. Other Carp fishes are in the next priorities of purchasing. In northern Vietnam the first preference of fresh water fishes, is Grass carp, and the first preference of southern Vietnam and Indonesia is Common Carp^[14]. But, Grass carp as a valuable fish and Silver carp as a worthless fish in China and Common carp as a worthless fish in China and India, have preference^[14]. So, by considering the high growth rate of production of these fishes, we can put a target for their export to

mentioned countries by increasing the production, improving the consumption trend and attention to target countries principles.

Babai^[8] also believes that the low consumption is because of bad taste and odor, not to get use to, bad supplying and not being sanitary of farmed fishes. Generally, increasing the consumption will happen by better quality, variety, easy access and decreasing the price^[41]. In Canada and America also, 24% of statistical society know the price as the main factor of decreasing consumption^[33]. Adeli^[2] showed that 63% of statistical society are interested in freeze packed fish and prefer clean fish, and as this research says, printing the nutrition facts on the package has a high preference. Dalimore^[12] showed that 84% of consumers check the label of nutrition facts on the package, and by improving the organic and ecolabled productions, consumption has had 25% growing annually.

So, it is clear that the parameters such as live fish selling, quality and price are the most important factor among all users in the world, but the difference of views of consuming farmed fish between Iranian and European people, is the probability of mercury existence in wild fish, which bring them in the second propriety of purchasing, but in Iran good and easy access, less price and live fish selling has put it in the first step.

So, informing people about properties and advantages, supervision on prices, improving the quality of farming and organizing the supplying spots and more researches, will be the most important strategies in Iran to improve the consumption of farmed fish.

ACKNOWLEDGMENTS

Herein, I appreciate the financial support of Tehran Fishery (SHILAT) Organization, fishery educated students in filling the questioners and helping Dr. Yoosefi and Dr.Vahedi.

REFERENCES

1. Akpinar, M.G., E. Dagistan, Y. Mazlum, M. Gul, B. Koc, Y. Yilmaz, 2009. Determining household preferences for fish consumption with conjoint analysis in Turkey. *Journal of Animal and Veterinary advances*, 8(11): 2215-2222.
2. Adeli, A., 2005. The role of packing aquatics on the consuming behavior of the families of Tehran city. *Fishery PHD seminar*. Gorgan University of Agricultural Sciences and Natural Resources, pp: 55.
3. Adeli, A. and B. Shabanpour, 2007. Study on Tehran citizens behavior change in consumption of the aquatic products. *Iranian Scientific Fisheries Journal*, 16(2): 117-126.

4. Adeli, A. and B. Shabanpour, 2007. The role of packing aquatics on the consuming behavior of the families of Tehran city. *Journal of Agricultural science & Natural resource*. Special issue, 14(1): 91-99.
5. Adeli, A., 2008. Principles of marketing and aquatics packaging. Binahayat publishing, pp: 204.
6. Annual Statistics of Iranian Fisheries, .2008. Planning and development office of Iranian Fisheries Organization, pp: 56.
7. Babaii, A., 1995. Examining the fish consumption market development in Iran(Tehran), final MSc thesis of commercial management and administrative science, Tehran university, pp: 232.
8. Babaii, M., 2002. Effective parameters on farmed fish consumption. University final MSc thesis of commercial management and administrative science, Management Faculty, Tehran University, pp: 231.
9. Bloorian Tehrani, M., 2001. Marketing and market management, Third edition, Trading publication center. Institute for trade studies and research, pp: 288.
10. Bose, Sh. and N. Brown, 2000. A Preliminary investigation of factors affecting seafood consumption behavior in The inland and coastal regions of Victoria, Australia. *Journal of consumer studied & Home economics*, 24: 257-262.
11. Botrel, S., 2007. Quality requirements in the French seafood market. Correardb consulting Norge Conference, <http://www.seafood.no/binary?id=81629>.
12. Dallimore, J., 2005. Changing consumer Demand. Mega-trends that will influence the future production in Aquaculture.Trondheim.TNC.
13. Delgado, L.C., N. Wada, W.M. Rosegrant, S. Meijer, M. Ahmed, 2003. Fish 2020, Supply and demand in changing global markets. International Food Policy Research Institute Washington, D.C. World Fish Center. Penang, Malaysia, pp: 232.
14. Day, M.M., M.A. Rab, F.J. Paraguas, S. Piumsombun, R. Bhatta, M.F. Alam, M. Ahmed, 2005. Fish consumption and food security in Asia: A disaggregated analysis by types of fish and classes of consumers in selected Asian countries. *Aquaculture Economics & Management*. World Fish Center. Penang. Malaysia. Taylor & Francis Ltd., pp: 89-111.
15. Day, M.M., Y.T. Garcia, P. Kumar, S. Piumsombun, M.S. Haque, L. Li, A. Radam, A. Senaratne, N.T. Khiem and S. Koeshendrajana, 2008. Demand for Fish Asia: A Across-Country analysis. *The Australian Journal of Agricultural and Resource Economics*, 52: 321-338.
16. FAOSTAT, 2007. Food & Agricultural Organization. Information internet. Fishery Statistical Collections, Consumption of Fish and Fishery Products.
17. Foster, CH., 2005. Fish consumption patterns and consumer perceptions, The University of Manchester.
18. Hajimohamadi, R., 2002. Presentation the improvement methods of fishery management in order to preferment product, quality, distribution and aquatic's consumption in the biggest cities Iran (Case study of Tehran). Industry faculty of Amirkabir University of technology, MSc final thesis of systematic and productivity management, pp: 73.
19. Hanson, G.D., G.P. Rauniyar, R.O. Herrmann, 1994. Using Consumer Profiles to Increase the United States Market For Seafood: Implications For Aquaculture. *Aquaculture*, 127: 303-316.
20. Iranian Statistics Center, 2009. Population and dwelling statistics 2006. Total results of Tehran city (22 localities) publication of management office of international and public relation, pp: 116.
21. Karimzade, A., 1998. Academic method of marketing of foodstuff, the necessity of foodstuff growth and improving non-oil exports, *Journal of agricultural economy and development*, 22: 67-88.
22. Khiem, N.T., S. Koeshendrajana, 2008. Demand for fish Asia: a across-country analysis. *The Australian Journal of Agricultural and Resource Economics*, 52: 321-338.
23. Kianfar, H., M. Abdulahi, A. Hoshyarrad, M. Amini, M. Dadkhah and T. Zoghi, 2001. The pattern of sea food consumption including: Fish, Caned Tuna and Shrimp, among teachers of 4 education areas of Tehran city- 1379-Institute of nutrition research and food industry of Iran, pp:44.
24. Kotler, Ph. and G.M. Armstrong, 2005. Principles of marketing. Pearson prentice hall., 11th ed.711.
25. Meigolinezhad, A., 2000. The Effective parameters of fish consumption in land-locked cities and the method of increasing fishes by using Delphi Method, Amirkabir University of Technology, MSc final thesis, pp: 88.
26. Nourizamanabadi, N., 1997. Examining the effective parameters on consumer's behavior of fishery products, 6th Iran Shilat conference articles, (fishery marketing), Iranian Fisheries Co., pp: 448-460.
27. Rostami, M.R., 2001. Study the mix factors of marketing effects on the Behavioral mechanism of fishery products consumers in Iran. MSc final thesis Tarbiat Modares University, pp: 188.

28. Sharifi, H. and J. Najafi zand, 2003. Statistics methods in the behavioral science. Sokhan publishing. 11th ed.387.
29. Tull, D.S. and D.I. Hawkins, 1993. Marketing research: measurement and method: a text with cases. Macmillan publisher. 6th ed.796.
30. The International and Public Relation Bureau of Iranian Fisheries Co., 1996. Examining the consumer's behavior of fishery products in 20 localities of Tehran, research & development department, Iranian fisheries Co.(Shilat), 95.
31. Leek, Sh., S. Maddock and G. Foxall, 2000. Situational determinants of fish Consumption. *British food journal*, 102(1): 18-39.
32. Musgrove, Ph., 1985. Household food consumption in the Dominican republic: effects of income, price, and family size. *economic development and cultural change*, 34(1): 83-101.
33. Opinion Dynamics Corporation, .2005. Salmon of the American. Power Point. http://www.salmonchile.cl/files/Imagen%20Salmon%20en%20EEUU_SOTA.ppt#2
34. Quagraine, K., S. Hart, P. Brown, 2008. Consumer acceptance of locally grown food: The case of Indiana Aquaculture Products. *Aquaculture Economics & Management*, 12: 54-70.
35. Redkar, S.B. and S. Bose, 2004. Modeling purchasing dictions of seafood products: A case study of Munmbai, India. *International Journal of Consumer Studies*, 28(1): 75-85.
36. Salehi, H., 2006. An analysis of the consumer market for carp and carp products in Iran. *Iranian journal of fisheries sciences*, 5(2): 83-110.
37. Sechena, R., C. Nakano, Sh Liao, N. Polissar, R. Lorenzana, S. Truong, R. Fenske, 1999. EPA Environmental justice Community/university Partnership Grant.
38. Spinks, A. and Sh. Bose, 2002. Factors affecting households seafood purchasing decisions in Auckland, new Zealand: an empirical analysis. *International journal of costumer studies*, 26: 62-70.
39. Vannuccini, S., 2004. Overview of fish production, Utilization consumption and trade. FAO, Fishery Information. Data and Statistics Unit. Rome. Italy, pp: 19.
40. Verbeke, W. and K. Brunso, 2006. Consumers trends in consumer preferences and role of information for farmed versus wild fish. *Future Aquaculture*. Duino, Italy. September 14-15.,www.SeafoodPlus.org.
41. Verbeke, W., I. Sioen, K.D. Brunso, S.V. Henauw, J. Camp, 2007. Consumers perception versus scientific evidence of farmed and wild fish: Exploratory insights from Belgium. *Journal Aquaculture international*, 15(2): 121-136.
42. Ye, Y., 1999. Historical consumption and future demand for fish and fishery products: exploratory calculations for the years 2015/2030. Mariculture and fisheries department Kuwait institute for scientific research. Food and Agriculture Organization of the United Nations, pp: 37.