

Attitudes towards fish consumption and Farming: Reducing Reliance on Imported Fish

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Abstract

The purpose of this research was to investigate the attitudes of Saudi households in the Kingdom of Saudi Arabia (KSA) towards fish consumption and fish farming. The study was conducted in the Jizan province of KSA and data was collected through a well-structured questionnaire from 100 participants. The Pearson Correlation Coefficient was used to determine the significance of the two variables. The findings revealed that the majority of the respondents (37%) were aged between 25 and 34 and had a high level of education (35% up to the university level). Most respondents (31%) consumed fish and were aware of its nutritional value, although the majority (85%) were dissatisfied with the price. None of the participants engaged in fish farming, and most (83%) had no intention of doing so in the future. In conclusion, the study found that fish consumption and preference were high in the Jizan province, with fish being preferred over chicken and meat due to its nutritional value. However, age and education level had a negative impact on respondents' opinions of fish prices. The study recommends the development of policies to educate people about fish farming, specifically through fisheries extension services, in order to enhance interest and participation in this activity.

Introduction

Fish is an important source of animal protein in many countries. Some countries such as Bangladesh, Indonesia, and the Solomon Islands depend on fish for above half of their animal protein consumption (Kawarazuka, 2010). Yet, in the latest years, a crisis has developed worldwide in fish resources (Watson et al., 2014).

According to the Food and Agriculture Organization of the United Nations (FAO), the global per capita consumption of fishery products was approximately 18.9 kg in 2011 with an average annual growth rate of 1.62% from 2001 to 2011 (FAO, 2014). Increase in the rate of fishing is followed in many different cultures comprising both rural and urban areas (Bienenfeld et al., 2003). However, the supply of fish worldwide is reduced in recent years (Watson et al., 2014).

Fish provides protein, vitamins, and different nutrients to its consumers which are necessary to human health (Sun, 2008), and globally fish represents about 16.6 percent of animal protein supply and 6.5 percent of all protein for human consumption (FAO, 2012a,b). Globally, fisheries or aquaculture farming provides employment opportunities and hence an important

source of uplifting the socio-economic status. An estimation of 660 and 880 million people depends totally or partly on aquaculture as a basis of earning and livelihood (Allison et al., 2013). Aquaculture development in dry environmental conditions such as desert lands needs the adoption of production technologies that focus on water management practices and the introduction of modern aquaculture technologies such as recirculation system principally if high-density aquaculture is technically and eco- nomically reasonable. This system typically needs a small area and is enormously effective with the usage of water having production of fish up to 50 kg/m³ of water (Kolkovski et al., 2013). The aquaculture sector can contribute to overcoming a decrease in food security. Globally, this sector is the fastest source of pro- viding animal food, overtaking terrestrial production of meat and capturing fisheries (FAO, 2002).

Saudi Arabia with an area of 2.15 million km² is an arid and water-deficit country with limited freshwater supplies. The K is a desert-like country lying within the continental zone where temperatures are high in summer and low in winter. It is also characterized by low annual rainfall and lacks perennial rivers or permanent ponds of water. The climatic conditions pose a continual challenge, as does the depletion of underground water resources. Due to an acute deficit, water has always been an extremely valuable resource and occupies a prominent and prime position among the natural resources of the Kingdom. Although water is a renewable resource, its availability is extremely low to society. In this situation, there is tremendous pressure on the existing water resources due to an increase in population, and the rising living standards of civil society (FAO, 2009). The scarcity of freshwater confirms that fish farming is the future for fulfilling Saudi's future fish-food demand, especially fish farming production along the Red Sea coast.

Saudi Arabia is the most populous country in the Gulf Cooperation Council (GCC) region having approximately 30 million people with a long coastline and warm water inlets that are perfectly suitable for aquaculture. The aquaculture in the Kingdom initiated in 1980s since the Ministry of Agriculture recognized its importance because of the favorable conditions for fish farming (FAO, 2020). Even though fish is not actually a primary food of the Saudi diet, demand for fresh fish is on the rise. Annual fish consumption per capita enhanced from 3 kg in 1977 to 6.5 kg in 1998 and touched around 8 kg in 2017. In 2020 per capita supply is just 11.5 kg in the country (FAO, 2022a,b). Hence the need to reduce reliance on imported fish.

Reducing reliance on imported fish refers to efforts to decrease the amount of fish and seafood that a country or region imports from other countries. This can be achieved through a variety of means, such as increasing domestic fish production, promoting sustainable fishing practices, and reducing demand for imported fish through education and awareness campaigns. There are several reasons why reducing reliance on imported fish is important. First, overreliance on imported fish can be a threat to food security, as it can make a country vulnerable to supply disruptions and price volatility in the global seafood market. Second, many imported fish products are associated with unsustainable fishing practices and may contribute to overfishing and habitat destruction. Third, importing fish from distant locations can also result in a significant carbon footprint due to transportation emissions. To address these issues, governments, NGOs, and the private sector have been working to develop strategies to reduce reliance on imported fish (Allison et al., 2013). This can include investment in aquaculture and sustainable fishing practices, increasing consumer awareness about the impacts of imported fish, and promoting local and seasonal seafood consumption. By taking a comprehensive approach, it is possible to achieve a

more sustainable and resilient seafood system that benefits both the environment and local communities. One paramount factor in sustainable fishing practices is the attitude toward fish farming.

Attitudes toward fish farming refer to the general opinions, beliefs, and feelings that people have about the practice of raising fish in controlled environments. Fish farming, also known as aquaculture, is an increasingly popular method of producing fish for food and other purposes. The present study aimed to investigate the fish consumption behavior and fish farming attitude in the Kingdom of Saudi Arabia with the following objectives:

1. To examine the fish consumption pattern and preferences of Saudi households in the study area.
2. To determine the future intentions of the respondents about fish farming in the study area.
3. To provide suggestions and recommendations for future policy implementation.

Research Methodology

The study was conducted in Jizan province, Saudi Arabia. Jizan province is located in the southwestern part of Saudi Arabia and is known for its large-scale aquaculture activities. Jizan is home to several fish farms that produce a variety of fish, including tilapia, catfish, and shrimp. The present study provided information regarding fish consumption behavior and fish farming attitude of Saudi people in KSA. For conducting this research, a fish consumption survey was carried out by interviewing the respondents at fish sites, markets, and malls in 2015. The respondents were selected through a purposive sampling method and the interview was conducted in Arabic by the interviewer. The questionnaire was phrased in a very simple and straight Arabic language avoiding technical and scientific terms. The overall number of respondents for the interview was 100 out of which 80 were males and 20 were females. Data acquired through surveys were coded, entered into SPSS (Statistical Package for Social Sciences), and screened for errors prior to analysis (Nie et al., 1975). All the variables were clearly defined and labeled. SPSS-25 was used for data analysis. Both descriptive and inferential statistical tools were employed to analyze the data. For summarizing demographic characteristics and perception of the respondents, descriptive statistics such as frequency distribution was used and Pearson Correlation Coefficient was used to determine the relationship between the dependent and independent variables.

Result and Discussion

It has been revealed in diverse research conducted on different social problems that age has a positive or negative influence on the behavior of individuals as indicated by (Siddiqui et al., 2003). Age determines the response of a person through different undertakings in his/her life. The rational decision-making process also depends on age. Rendering to different reports and research findings, it has been agreed upon that age and creativity, and adaptability are positively correlated. In other words, the younger is a person, the more rapid will be his/her adaptability and responsiveness to any activity, particularly, in communication and understanding.

Age group	Percentage
Less than 25	26
25–34	37
35–44	24
45–54	8
55–64	5
Total	100

Table 1 shows that the majority of the respondents 37% fell in the age group of 35–44. This was the dominant age of the respondents in the study area followed by 26% having less than 25 years of age whereas, 24% fell in the age group of 35–44, 8% in the age group of 45–54 and 5% fell in the age group of 55–64 respectively. From the table, it is clear that most of the study respondents in the area were young. Education plays an important role in the adoption of anything as literate people are more capable as related to the illiterate who are more conventional/orthodox.

Educational level	Percentage
Illiterate	5
Elementary	11
Secondary	11
High School	35
University	35
Post Graduate	3
Total	100

Table 2 shows that the majority of the respondents 35% were having qualifications up to the university level and 35% up to the high school level. Moreover, only 5% of respondents were illiterate in the study area. It shows that the overall literacy level in the study area was encouraging.

Fish consumption per month	Percentage
Never	12
Once a month	31
Two times a month	21
Three times a month	13
Four times a month	18
Mostly	5
Total	100

Table 3 depicts the frequency of monthly fish consumption by the respondents. It was found that 12% of the respondents do not eat fish in a month whereas the majority of people that is 31% eat fish once a month, 21% twice, 13% thrice, 18% four times and 5% eat fish mostly in a month. As it is clear that most of the respondents in the study area were of high qualification, they were aware of the nutritional value of fish, and hence consumption of fish was higher. Verbeke and Vackier (2005) stated in their study that higher education resulted in more intention to eat fish. Our results are not in agreement with those of the findings of Burger et al. (2014) who observed in their study that 3.7% of Saudi males and 4.3% of females do not eat fish.

Respondent's intention/attitude	Yes %	No %
Do you have fish farm at home?	0	100
Intentions of the respondents to have fish farm at home in future	17	83
Is fish price reasonable?	15	85

Table 4 reveals that all of the respondents do not have fish farm at their homes i.e. they were not engaged in fish farming. The reason for this was that the respondents had no technical know-how about fish farming in the study area. Moreover, only 17% of respondents had intentions to start fish farming at home in the future whereas the majority 83% had no intentions to start fish farming at their homes. Fish farming or aquaponics at home can provide food on a daily basis as indicated by Diver (2006) that a small-scale aquaponics system in the backyard of a Barbadian family can provide fresh food on daily basis for a long time and also can promote local food production and can support the local economy. Furthermore, the data shows that the majority of respondents 85% were not satisfied by fish prices in the market whereas only 15% said that the price is reasonable. As most of the seafood in the Kingdom is imported from other countries, the prices of this seafood are high. According to Nahab et al. (2011), fish consumption differs obviously as a function of ethnicity, age, income, and a variety of additional reasons.

Type of meat	Percentage
Red meat	11
Fish	81
Chicken	8
Total	100

Fish is considered an important source of nutritional food for humans. The data given in Table 5 depicts that the majority of the respondents 81% stated that fish is better for health, whereas 11% stated red meat and only 8% stated chicken is better for health. The reason for this may be that most of the respondents were aware of the nutritional value of fish because of their high level of education and hence preferred fish more as compared to red meat and chicken. According to Trondsen et al. (2003) that fish consumption behavior differs with opinions about personal weight, health, and income.

Way of cooking fish	Percentage
Barbecue	40
Frying	53
Normal cooking	3
Dislike	4
Total	100

Table 6 reveals that most of the respondents that are 53% preferred to cook and eat fish in a frying manner followed by 40% of respondents who preferred barbecue type whereas, 3% preferred normal cooking and 4% stated that they dislike fish. The reason for preferring the frying method by most respondents was due to its easier method of cooking and also most of the nutrients are not wasted by this method.

Variable	Age (years)	Educational level
How many times you eat fish in a month?	0.201*	.213*
Is the price of fish reasonable?	-.018*	-.067
Do you have intentions to have fish farm at home in future?	-.174	.197*

The data in Table 7 show the correlation between demographic characteristics such as age and educational level and dependent variables such as fish consumption per month, fish price, and intentions to have fish farms at home in the future. It shows that age and education have a positive and significant impact on fish consumption per month. The reason for this is that people with more age and education have more knowledge about the product quality, safety, and nutritional value of the fish. Olsen (2003) examined the relationship between

consumer age and seafood consumption in the United States and found that age was positively related to the frequency of seafood consumption. Furthermore, it is clear from the table that age and educational level have a negative impact on respondents' opinions about fish prices. Pethiyagoda and Olsen (2012) attempted to explain fish consumption behavior in Sri Lanka, focusing on the impacts of consumer attitude, convenience orientation, knowledge, variety seeking, and price consciousness. The results showed a positive relationship between attitude and fish consumption, an insignificant relationship between product knowledge and consumption frequency, and a negative relationship between price consciousnesses and fish consumption. Table 7 further shows that age has a negative and non-significant impact but the educational level has a positive and significant impact on the intention to have a fish farm at home in the future.

Conclusion and Recommendation

This study is exploratory research using a survey method to examine fish consumption behavior and fish farming attitude in KSA. The survey was carried out in Jizan province in KSA. It is concluded from the research findings that the majority of people consume fish in their diet per month. They also preferred fish as an important source of nutrition for their health and the consumption rate was higher than chicken and red meat. However, most of them were not satisfied with the fish price in the market and stated fish prices were very high. The study also concludes that fish farming was not adopted by any respondent at his home. However, some respondents showed their interest to start fish farming at their homes in the future.

As aquaculture plays a significant role in worldwide eradicating lack of food and undernourishment by providing fish and other marine products that are rich in protein, necessary fatty acids, vitamins, and minerals and can also make substantial contributions to the development by improving incomes, providing employment opportunities and enhancing the returns on resource use, it is highly recommended that the fisheries department should provide better training and extension services to the people about fish farming (aquaponics) that would improve the profitability of fish production. Aquaponics will be a suitable practice for producing fish in the Kingdom because it could provide food throughout the whole year in arid climatic areas such as KSA where water and soil resources are limited. It is thus essential to offer government support for sustainable fish farming in the Kingdom. There is also a need to check and balance the fish prices of responsible authorities in the market as well.

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