2020

SURVEY REPORT

Indian and Spanish Fish Consumer Survey Report

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1. Introduction

Fish and fish products are one of the most widely consumed food products across the world. Globally it constitutes as staple part and principle protein source in diets of a vast number of people. According to Food and Agriculture Organization about 171 million tonnes fish was produced in year 2016, 88% (over 151 million tonnes) of which was used consumed by humans as food. As per studies conducted, about 70% of fishes undergo different processing treatment prior to being sold for human consumption. Despite of ever improving technologies for processing and handling close to 27% of landed fishes are lost in processing chain (FAO, 2018). These fish losses are generally referred to as fish by-products or fish waste. These fish by-products usually consist of fish skin, scales, bones, head, viscera, trimmings, etc. and are of high nutritional profile.

Fish byproducts are rich source of protein, nutrients and other bioactivities components. Promising functional and rheological properties of fish byproducts, along with nutritional benefits advocates potential employment of fish by-products as food, health supplements and pet food.

Current utilization of fish by-products is usually limited up to production of silage, fishmeal etc. With increasing per capita fish consumption and improving technologies for utilization of fish by-products, application of by-product for development of food product and nutraceutical holds an immense potential.

2. Scope

This survey was conducted to analyze current fish product consumption trends and consumer acceptability of food items made from fish by-products in Indian and Spanish market. List of questions were prepared in order to gather data regarding various parameters such as consumer preference, consumption pattern and consumer awareness regarding human food, protein supplements and pet food

3. Background information

Indian participants

Consumers who participated in the survey were mainly of age group 20-35 year, all of them had basic education up to graduation. As per Figure 1, the highest number of participant’s ranged from age 24-28, wherein, the highest age group was 25 and 27, and lowest was age group is 29-35.

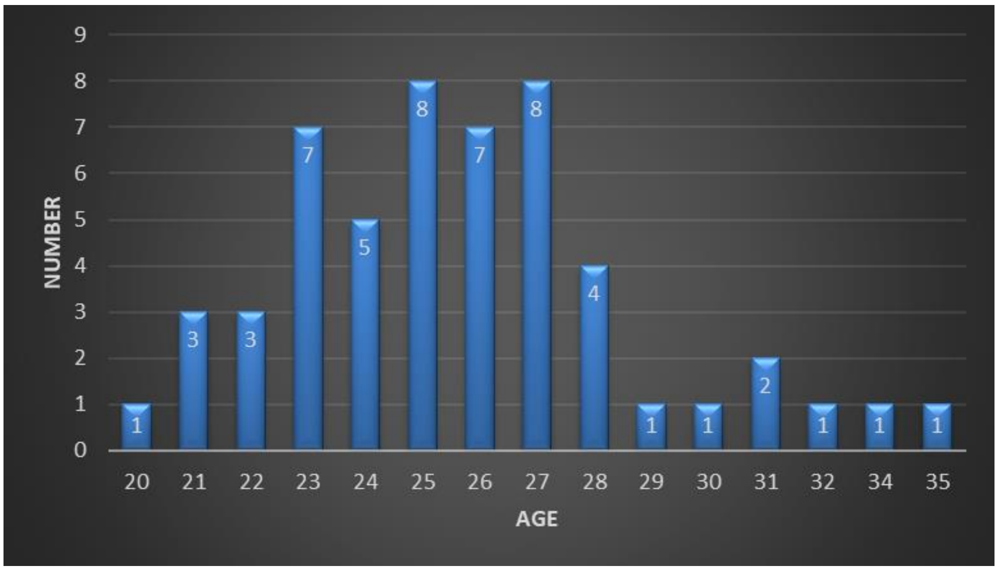


Figure 1: Age distribution of participants

Education plays an important role in deciding food preferences. Masses with basic education are generally more aware about importance of nutritional profile and try to make more conscious food choices. In this survey about 46% of the participants were students from varied backgrounds and rest were working as professional in various fields. Among the participants, 52% of the population had completed their Post-Graduation, whereas, 39% were pursing Graduation. 5% and 4% of the participants were the PhD holders and Chartered Accountants respectively (Figure 2).

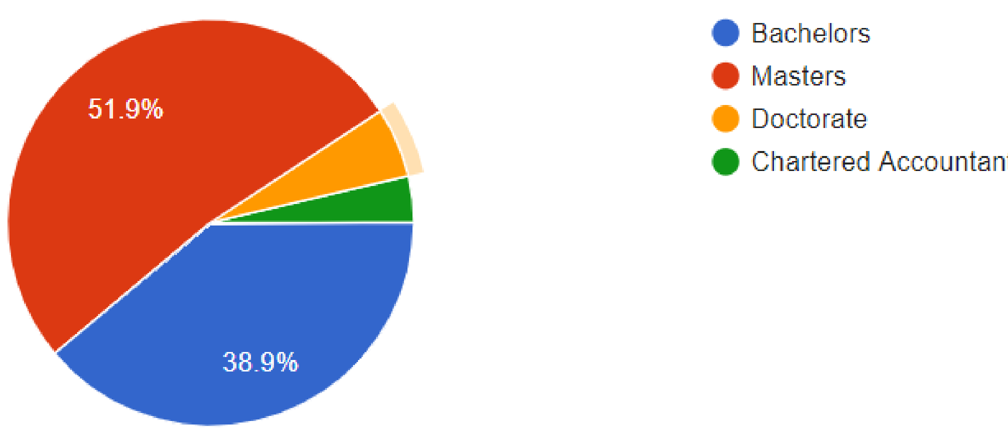


Figure 2: Education profile of participants

Most of the participants were males with the percentage of 56% while females cover the rest of 44% (Figure 3).

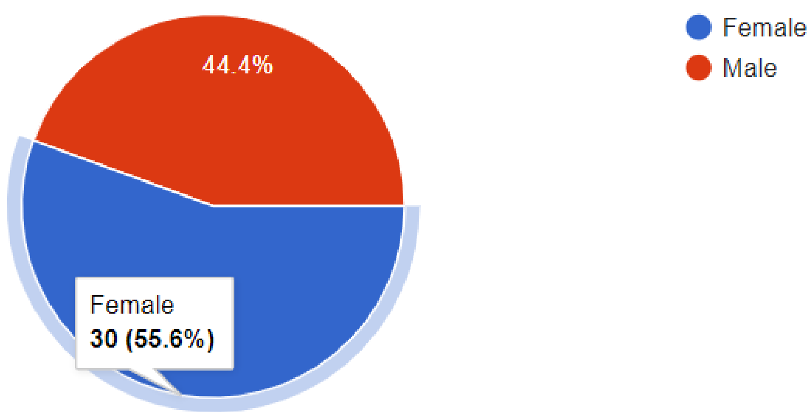


Figure 3: Gender profile of participants

Monthly family income of the participants plays a vital role in the survey as it depicts the idea of income over the spending. Monthly family income of the participants varied significantly, which can also play as a contributing factor in consumption of processed fish products. As per figure 4, participants with the income between 50,000 and 1 lac, and above 2 lacs, shares the equal proportion of 33% each. It was followed by 21% participants with the maximum income of 50,000 and ends with 13%population having the income of 1 lac to 2 lacs.

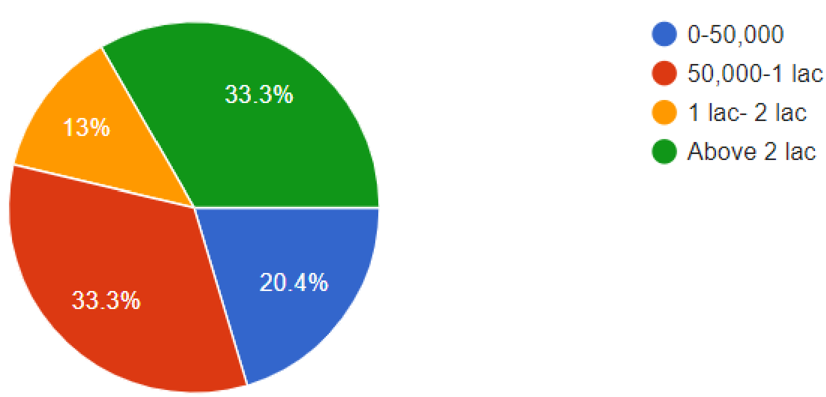


Figure 4: Income profile of participants

About 24% of the participants were regular gym members, which influence their knowledge about protein supplements and affects their dietary intake of protein. 78% of the population were regular gym goers who keep a tab on their protein supplements intake and its affects. On the other hand, 22% do not go to gym and usually do not have any knowledge about the necessary protein intake and affects (Figure 5).

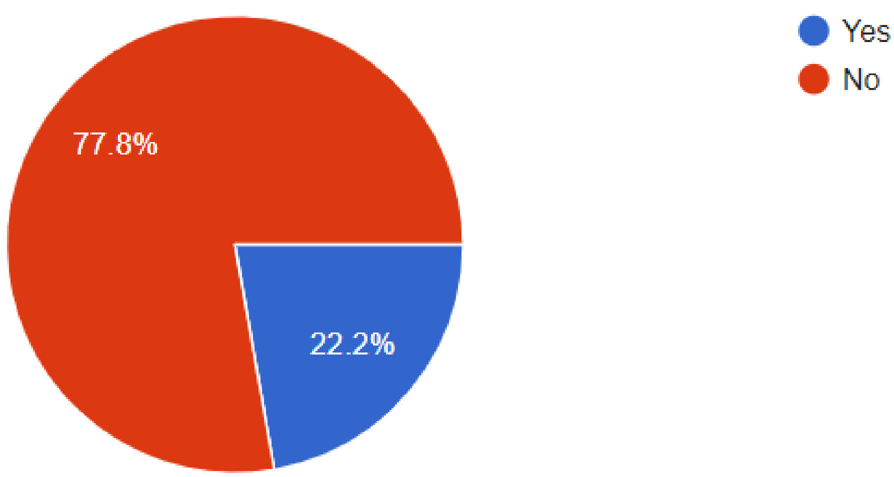
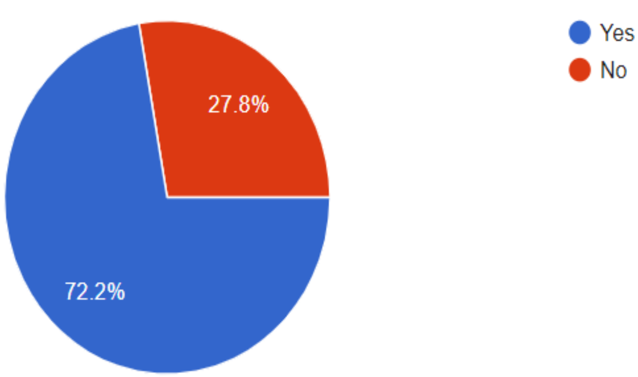
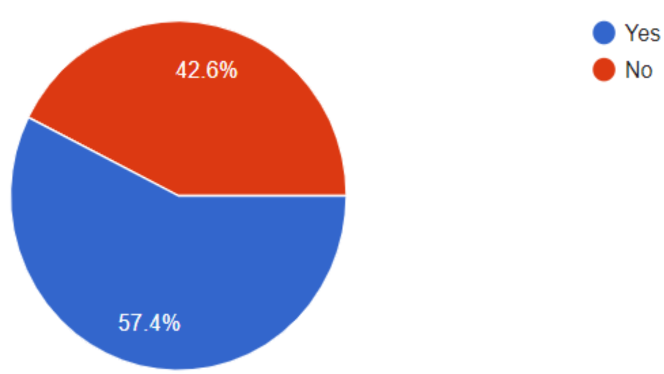


Figure 5: Percentage of gym goers

Figure 6 shows the awareness of processed fish products and fish by-products. As per figure 6a chart, 72% participants were aware about the processed fish products, whereas, 57% of the population know about the fish by-products, according to figure 6b.



(a)



(b)

Figure 6: Awareness about (a) processed fish product (b) fish by-product

Approximately, 26% of the participants were pet owners. On the other hand, 74% never had any pets at their home (Figure 7). These participants could provide their inputs regarding pet foods consumption, major brands, current issues and possible suggestions along with acceptability towards pet food produced form fish by-products.

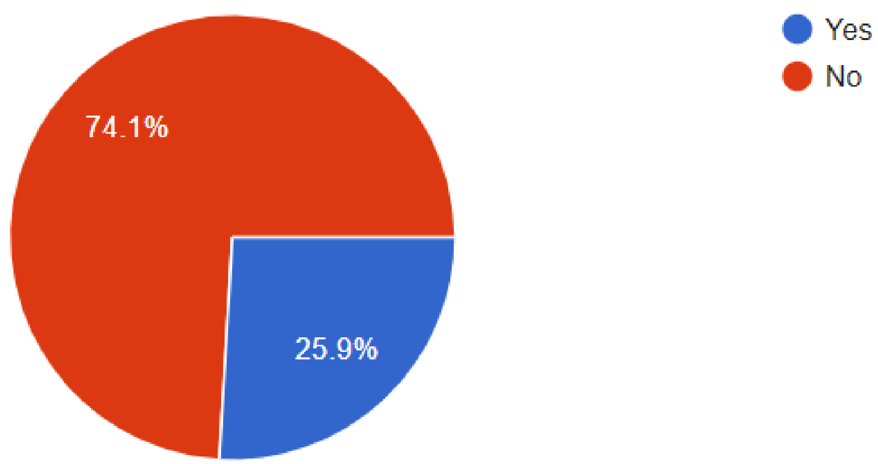


Figure 7: Pet ownership of participants

Spanish participants

Responses were gathered from participants from various group ranging from 20 years to over 50 years, which enabled to gain a broad overview of consumer's outlook. From the total number of responses received: the average age of respondents was 43.5 years. 28% of respondents were over 50 years old, 43% were between 40 and 49 years old, 7% were between 30 and 39 years old and 22% were between 20 and 29 years of age (Figure 8). The average family income is 4250 euros, but only 43% have answered this question. More than 90% of them have high degree studies.

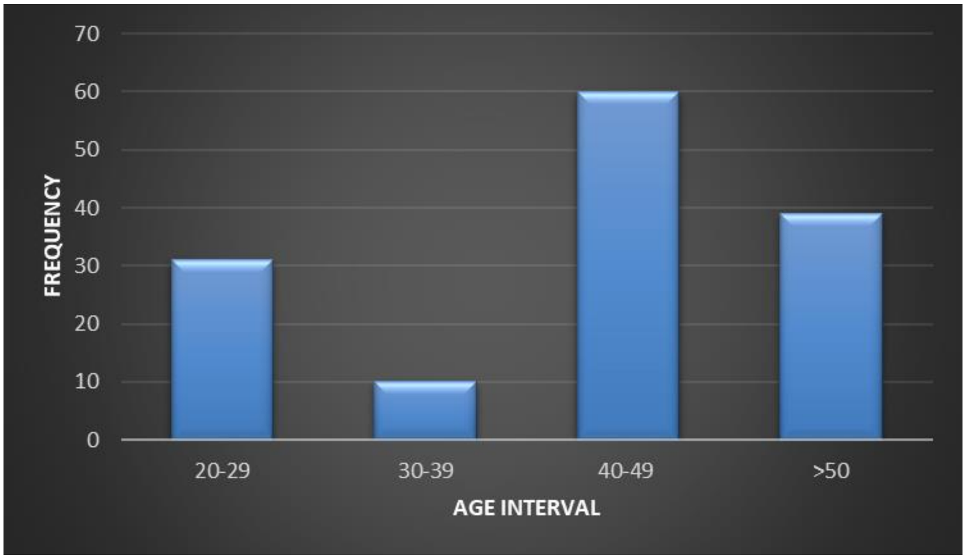


Figure 8: Age distribution of questionnaire respondents

A fairly similar male to female ratio was observed among Spanish consumers to that of Indian consumers in the survey with 43% of women and 57% men (Figure 9).

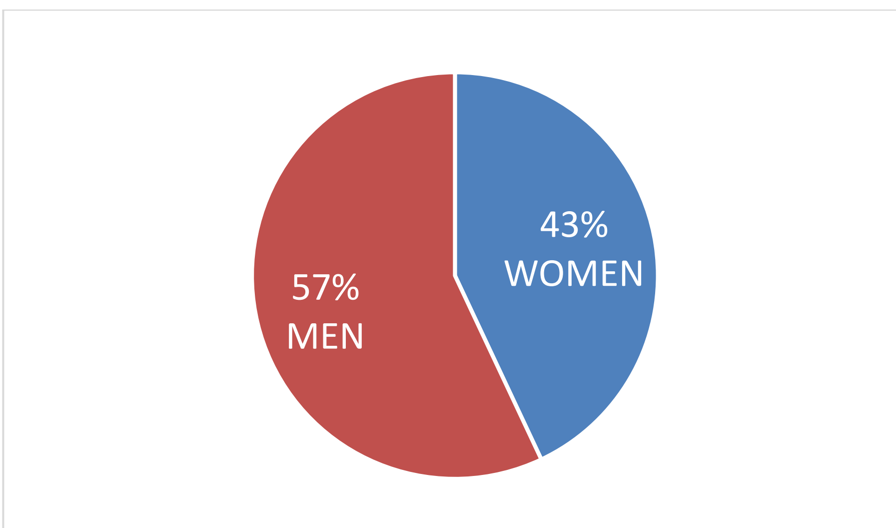


Figure 9: Gender profile of respondents

Among the participants only 43% were gym users, which comprises of equal number of male and female (Figure 10). Information about gym usage helped us to gain insight about potential market of health supplements and protein rich food products.

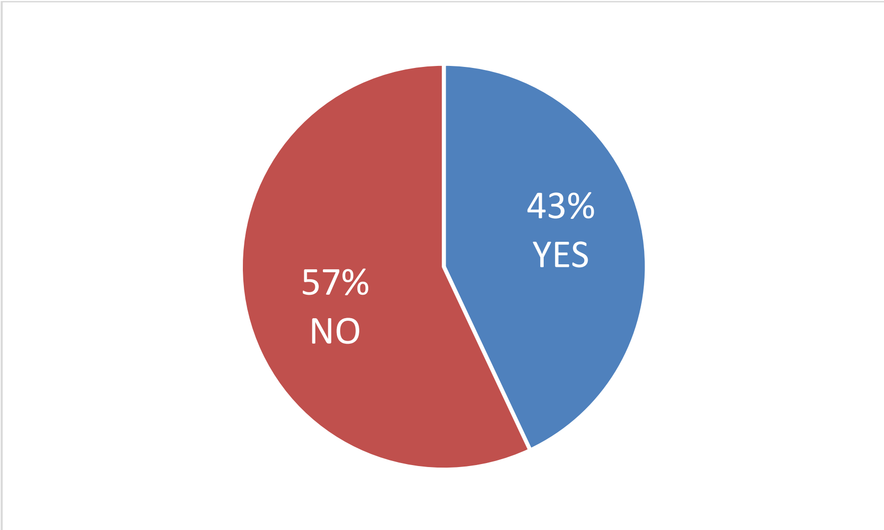


Figure 10: Percentage of gym users of the respondents

Only 28% of respondents stated that they have pets, and of these 50% were cats whereas dogs and hamsters comprise rest 50% of the pets (25 % each) (Figure 11, 12). Pet owners provided inputs regarding pet feed and acceptability of fish by-product based pet food.

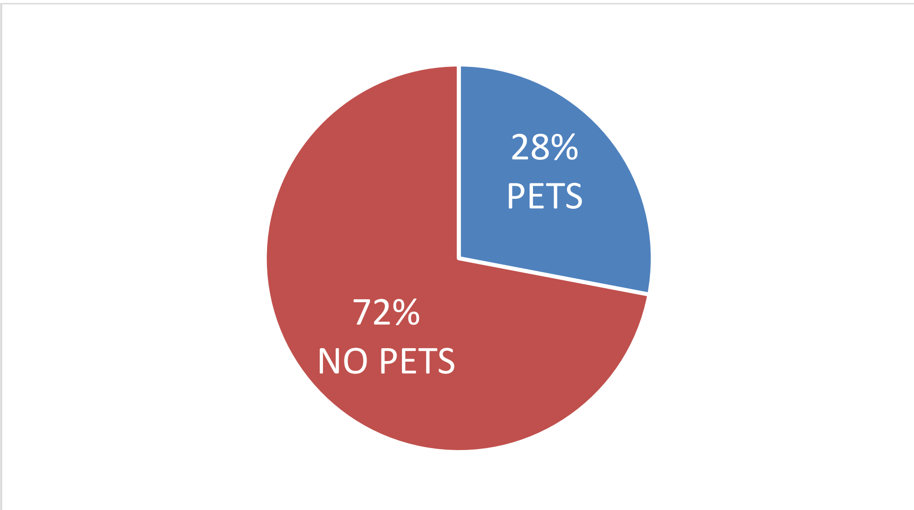


Figure 11: Percentage of respondents having pets at home

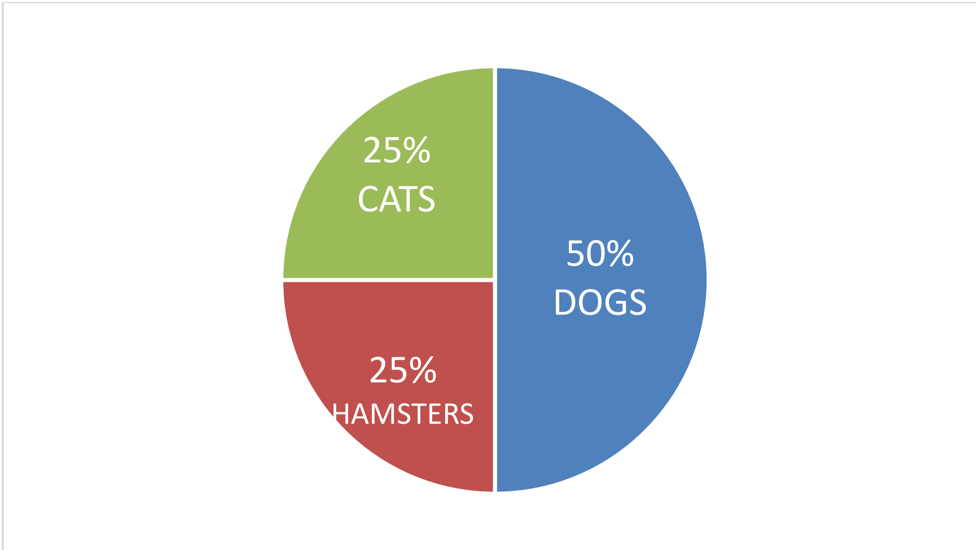


Figure 12: Types of pets of those respondents having pets at home

Consumers were also inquired about their knowledge regarding processed fish products and fish by-products. 35% of them stated that they have knowledge about products processed from fish. From this group of participants only 40% had knowledge about the by-products of the fishing industry. (Figure 13, 14)

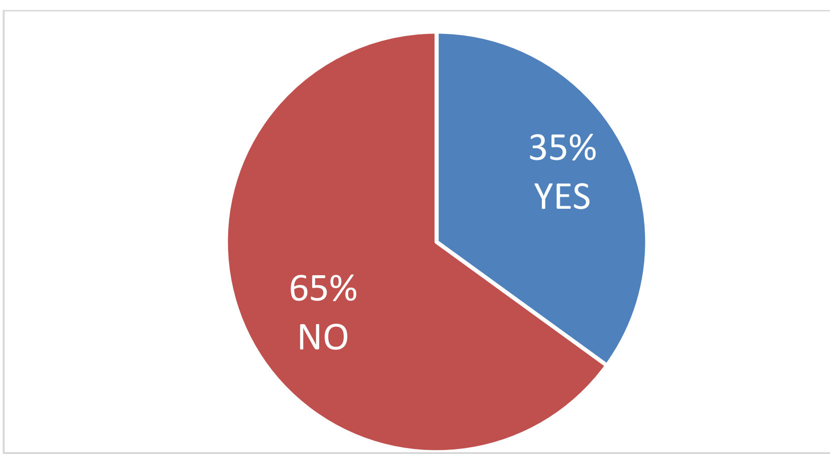


Figure 13: Respondents' knowledge about products from fish

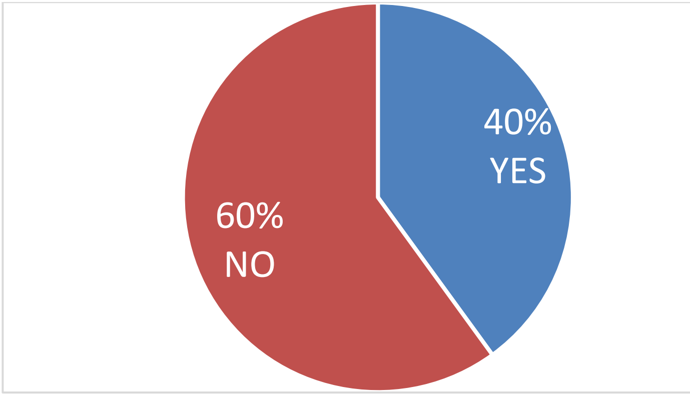


Figure 14: Respondents' knowledge about fish by-products from the respondents having knowledge about fish products

4. Observations

4.1 Indian Participants

4.1.1 Food for human consumption

Based on survey conducted different fish products such as **fish nuggets, fish cake, fish sauce, fish soup, fillets, fish fingers** etc. were identified. Among the consumed products **fish nuggets** were highly preferred one, chosen by almost 55% of the consumers (Figure 15).

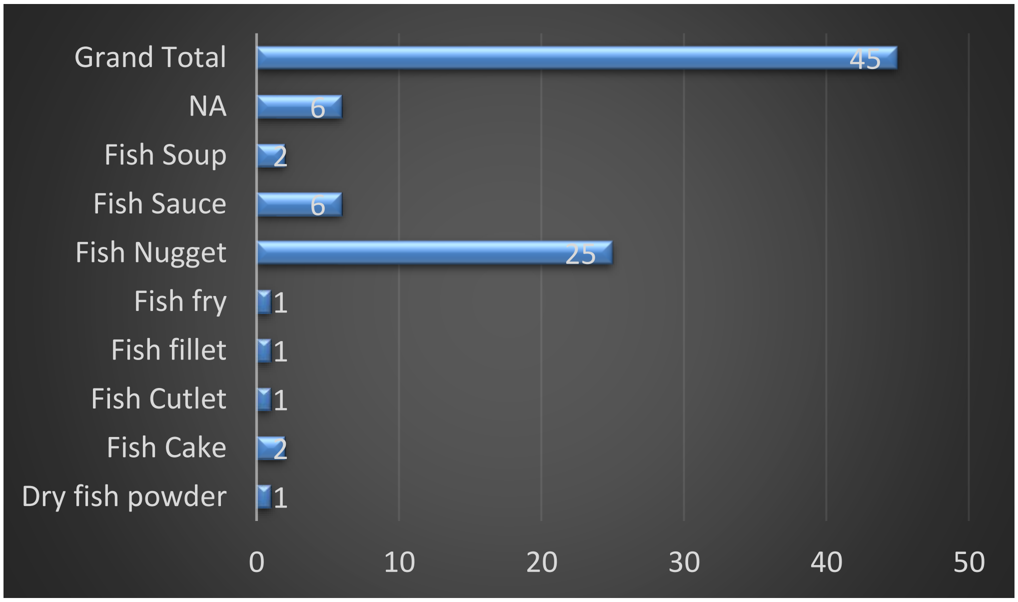


Figure 15: Most Preferred Fish product

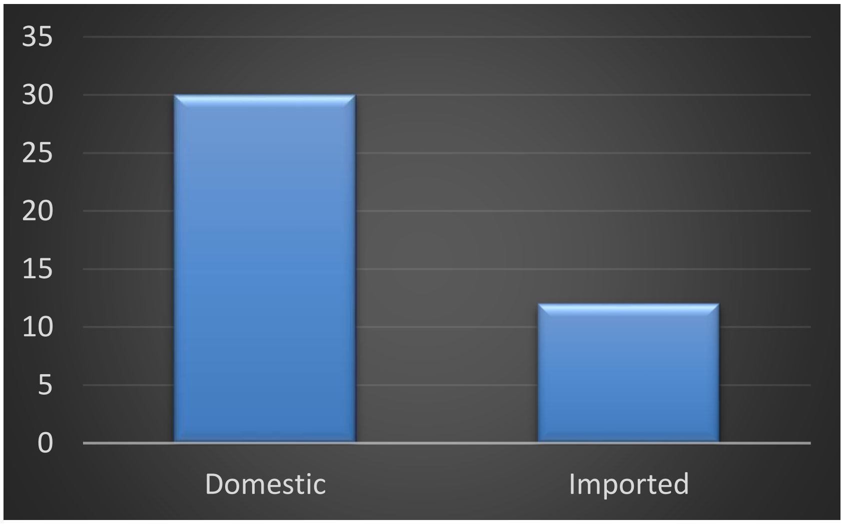


Figure 16: Manufacturing details of fish products consumed by participants

As per participants about **72% has consumed domestic processed** products **28% imported products** (Figure 16)**.**

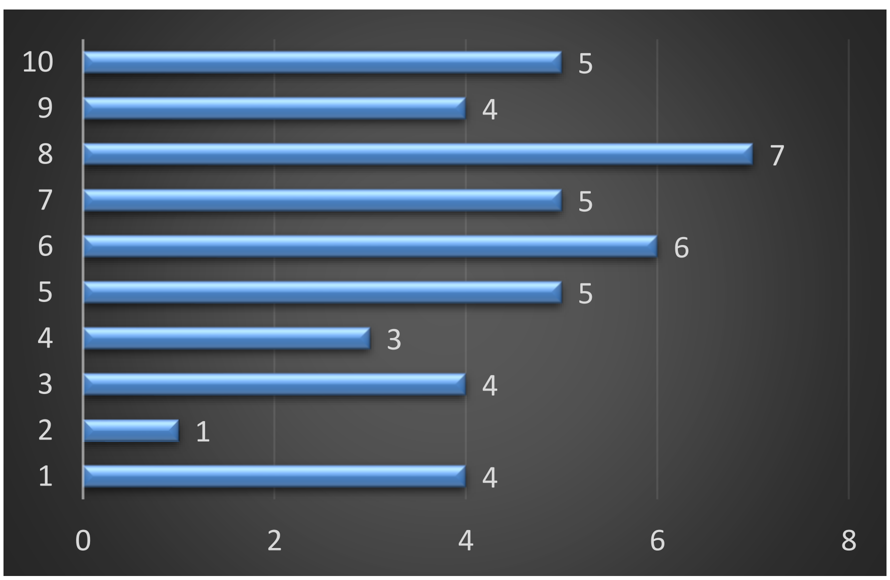


Figure 17: Acceptability of products manufactured using fish by-products on Scale of 10

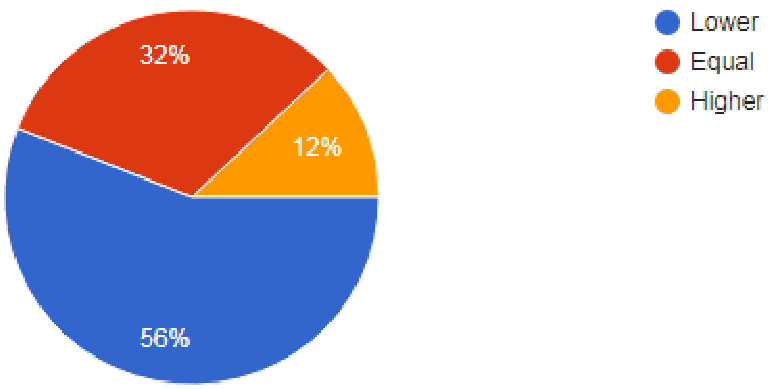


Figure 18: Expected pricing of fish by-product-based products as per participants

There was high acceptability of products made from fish by-product indicating a potential market opportunity. About **71% of the participants were given 5 points or more** towards acceptability of fish byproducts-based foods (Figure 17). However, about **56% of the participants felt pricing of byproduct-based products should be lower** in comparison to that made form whole fish or fresh fish (Figure 18)

4.1.2 Protein Supplements

Participants were observed for their current protein supplement intake and their problems with current protein supplements. About 76% of the participants found current protein supplements to be expensive. Among various brand of supplements **ON** and **Amway** were among most popular brands consumed by the participants (Figure 19). Regarding acceptability of fish-based supplements, nature of source of protein matter to half of the participants, however non-veg consuming participants were comfortable in consuming protein supplement form non-veg source as well (Figure 20). Protein in **powdered form was most preferred** form as health supplement Figure 21).

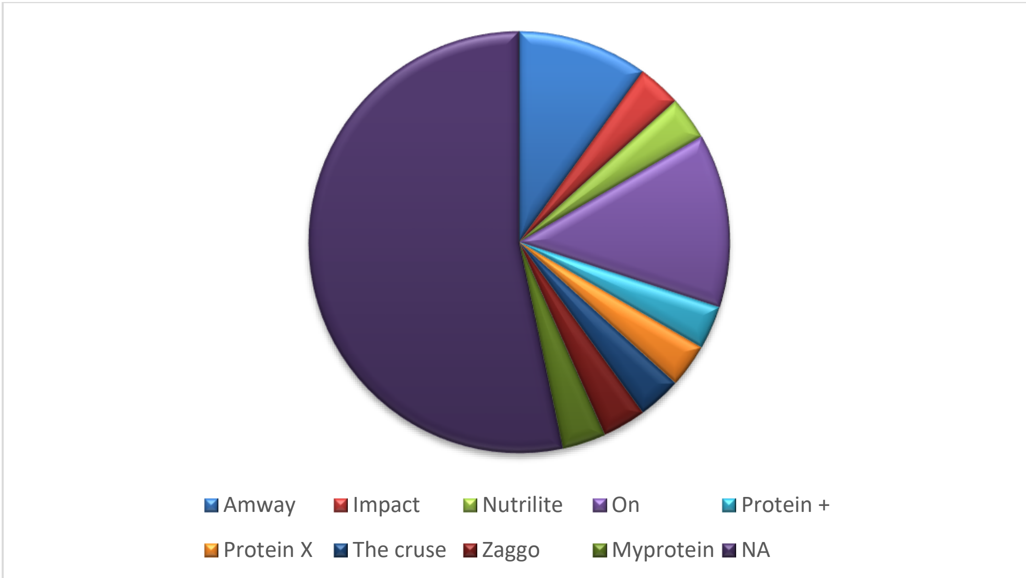


Figure 19: Protein supplement brand consumed

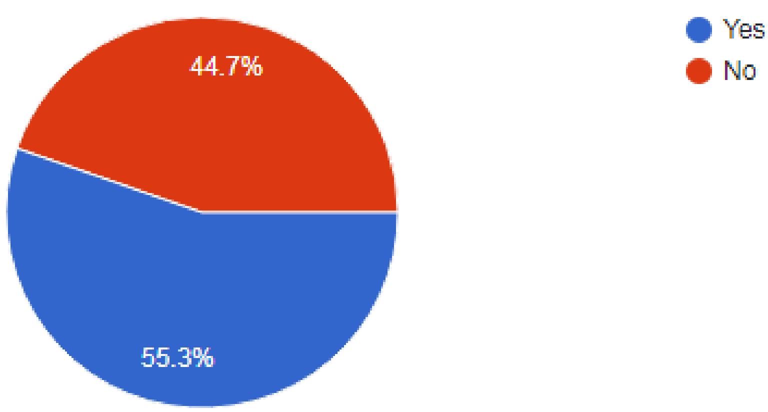


Figure 20: Biasness about nature of source of protein

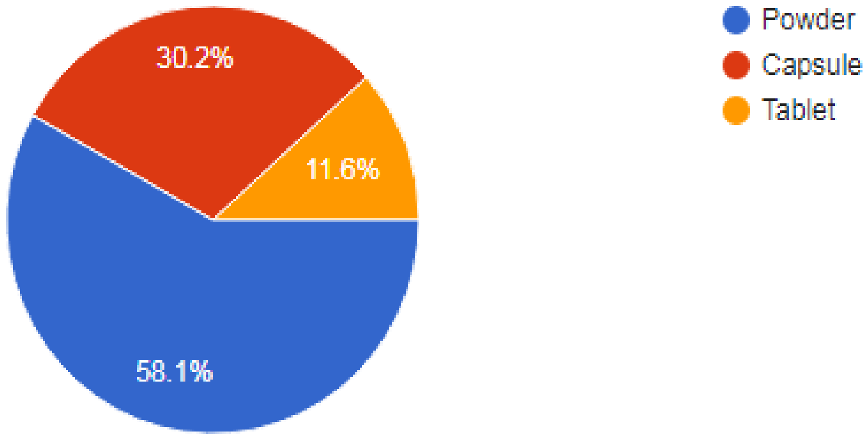


Figure 21: Preferred form of protein supplement

4.1.3 Pet food

Participants were observed for their current pet food choices and were enquired about possible suggestions and improvement they suggest as consumers. **Pedigree** was the most consumed brand, however about **56% of the consumer found it expensive**. Consumers also suggested that the market lacked more products, there is a lack of variety and there were issues regarding quality as well (figure 22).

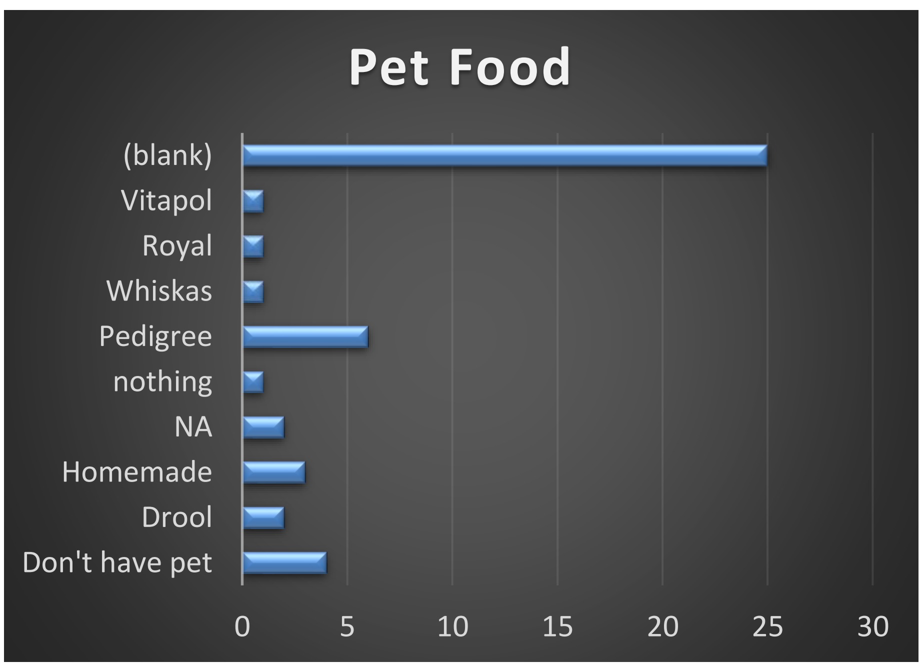


Figure 22: Pet Food bands consumed currently

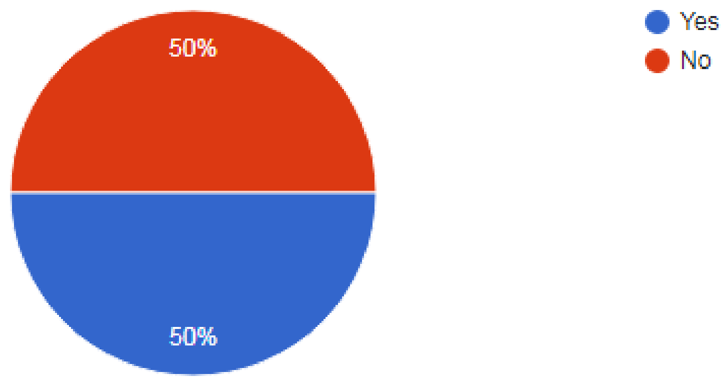


Figure 23: Satisfaction with current market options of pet food

On a scale of 10 about **73% of the participants found fish-based pet food acceptable** for their pets. However, about **43% were expected the pricing should be lower** than the options available in the market (Figure 24, 25).

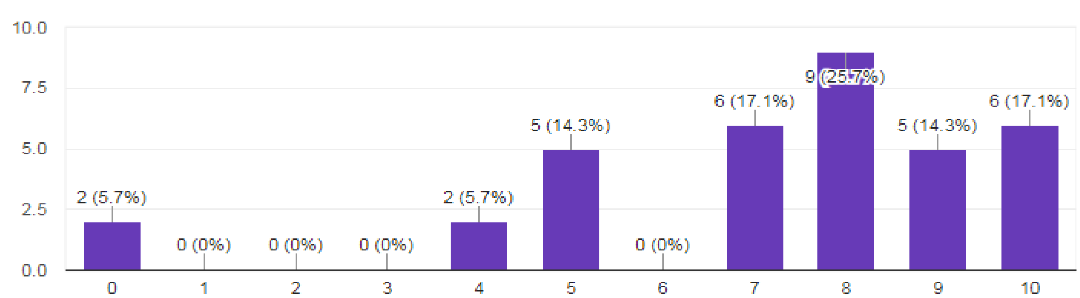


Figure 24: Acceptability of pet food manufactured using fish by-products on Scale of 10

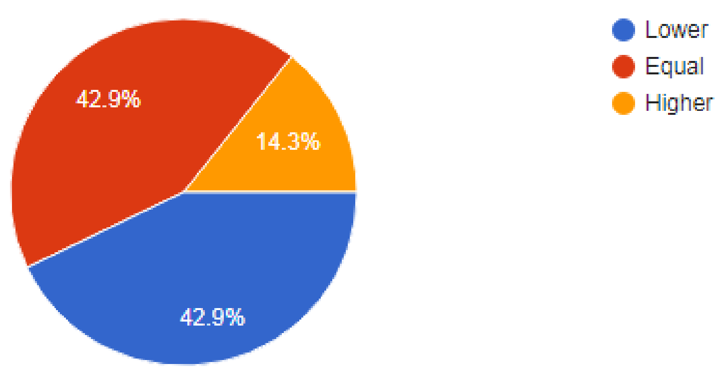


Figure 25: Pricing of fish by-product-based pet food

4.2 Spanish Participants

4.2.1 Processed foods for human consumption

We have asked for 4 typical products found in the market in Spain derived from fishing: fish Nuggets (product similar to chicken Nuggets, but made from fish that is usually offered breaded), “gulas” (surimi-based product that mimics eels), fish soup and fish sticks (surimi-based product that mimics crab meat or other crustaceans). We have left open the answer to suggestions.

People could choose several options in each question related to the previous products. 55.5% of the respondents marked fish sticks as a preference, 22.2% indicated “gulas”, 11.1% preferred fish soup and 11.1% chose fish nuggets. 100% who marked the Nuggets also marked the fish sticks. 50% who marked the soup also chose the fish sticks. “Gulas” were not chosen in any case as the only option since 100% of them were also chosen by the users of sticks, that is, 40% of the users of sticks also consume “gulas”. So, it seems that **sticks are the most demanded product** and other consumption of fish products is associated with it. (Figure 26)

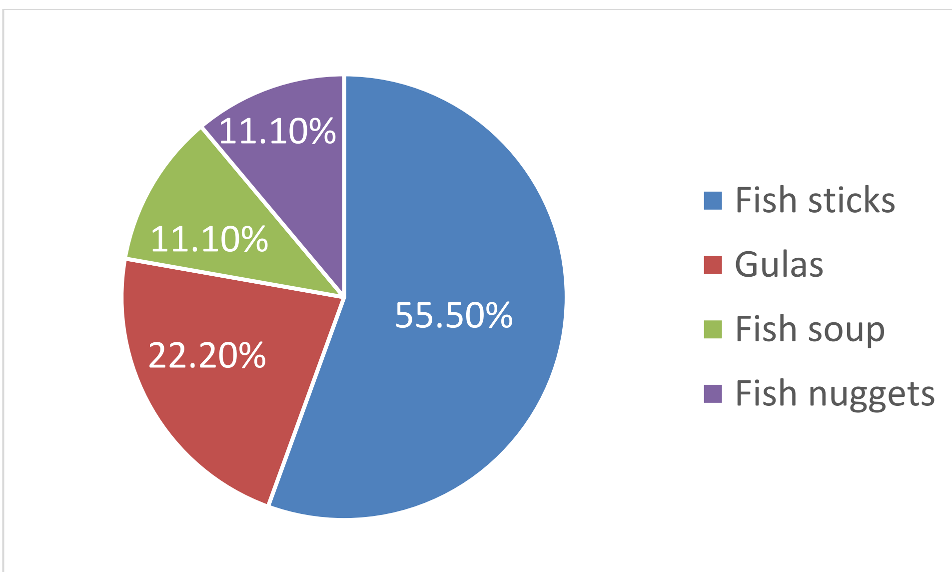


Figure 26: Distribution of consumed products by respondents

In the preference product section, only 64.3% of the respondents answer this section; **the most indicated product is “gulas” with 44.4%** of total, 33.3% prefer the sticks, 11.1% the soup and 11.1% the Nuggets. Therefore, the preference is not associated with consumption, and it should be correlated, that is, that the fish sticks that are the most consumed were preferred. It could happen that consumers do not match respondents to the questionnaire, or, in other words, that respondents are buyers, but not consumers in their home. (Figure 27)

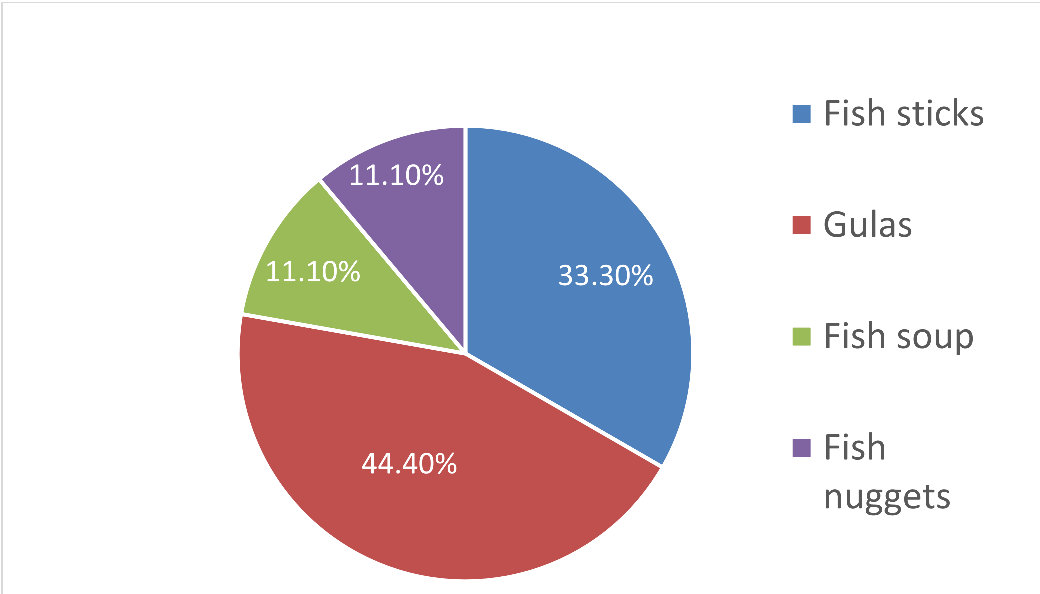


Figure 27: Distribution of preferred products by respondents

Suggestions in the questionnaire include fish croquettes, hake fingers and crab legs, a variety of the most elaborate fish sticks. (surimi-based product)

Only **36% know the origin of products** processed from fish, of which, 80% know or think it is of national origin and the rest think it is foreign.

65% of respondents were assessed for the acceptability of products manufactured from by-products of the fishing industry such as head, skin, bones or viscera, with **an average of 3.42 out of 10.** In our opinion, this is quite low. A large dispersion of values with the lowest rating being 3 and the highest being 8 should be noted. There is a trend towards average values: 55% of the answers are between 5 and 6.

84% believe that the prices of these products, which are made with by-products of the fish industry, **should be lower** than those made with whole fish. Only 16% of people think it should be equal. **Nobody thinks that the price should be higher**. 70% indicate they are satisfied with processed fish products present in the Spanish market (Figure 28)

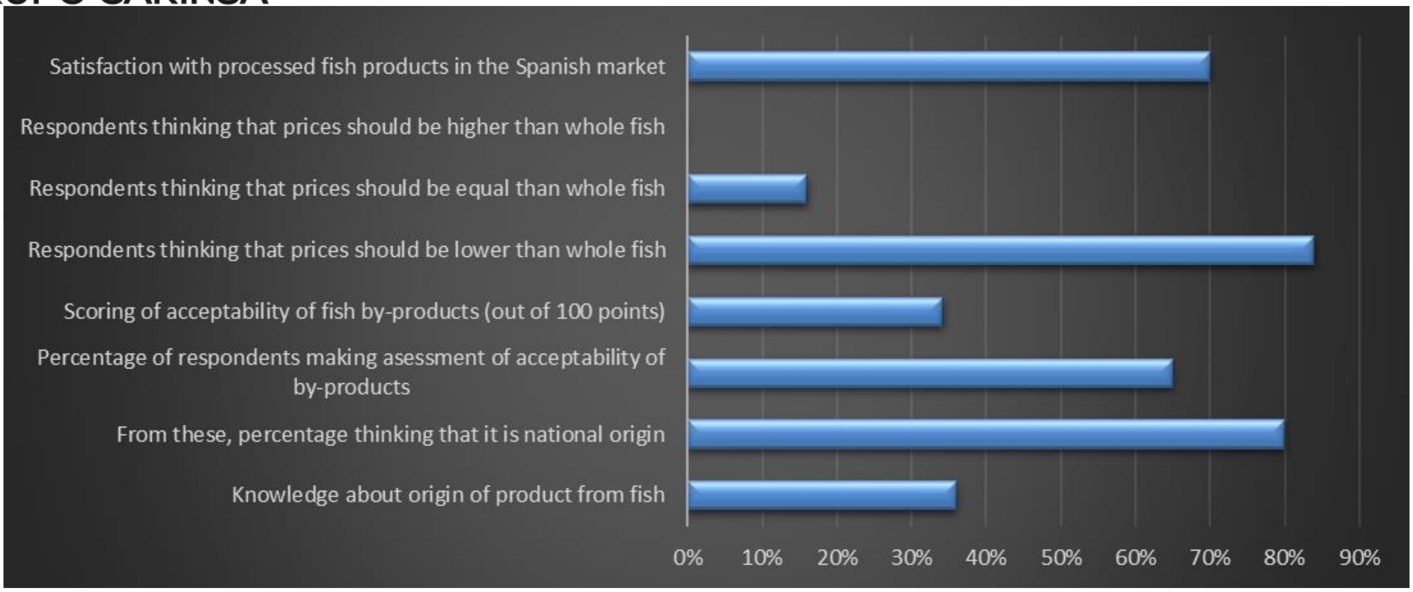


Figure 28: Results on several questions related to fish products

4.2.2 Supplemented healthy products

As described in figure 29, only 7% of respondents consume protein nutritional supplements. Of them, 100% consume them in the form of bars and powder.

71.4% answered the question of whether the protein source of these supplements matters. Of them, 50% affirm that they are interested about protein source and 50% think it does not matter. 100% of those who are concerned about source of these proteins mark plant source as preferred. Of those who do not express concern about the source, 80% do not mark either of the two options and 20% affirm that they do not care about protein source because it marks both sources.

No respondent indicates the name of a preferred or reference brand.

50% of respondents answered about the importance of the price. Among them, 71.4% show no importance for the price of these products.

Only 64% of respondents answered to product format preference. However, in this case the people who mark some option opt for two formats. 64.3% prefer the bars, 28.6% the powder format and 7.1% capsules. As we have already mentioned, there are multiple associated responses in the following way: people who marked the bars, 44.4% also marked the powder format, 11.1% capsules and finally 44.4% only marked the bars. Powder, capsules or tablets were not marked as the only option, and tablets were not marked under any circumstances.

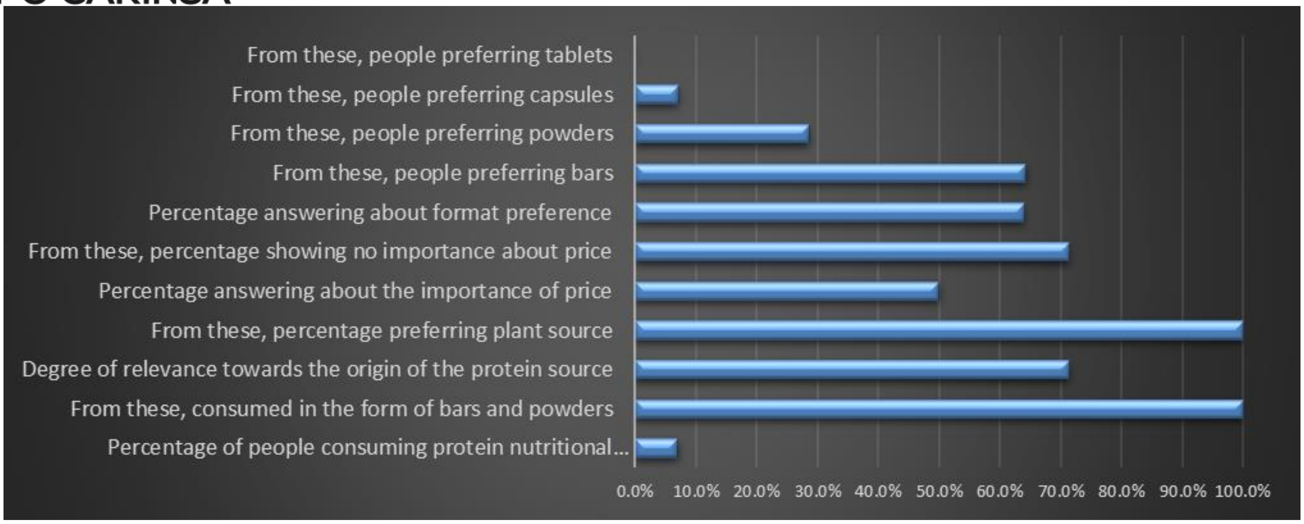


Figure 29: Results on several questions related to protein nutritional supplements

4.2.3 Pets feed

As indicated at the beginning of this report, only 28% of respondents have pets: 50% are cats, 25% are dogs and the other 25% are hamsters. The product brands mentioned are **Affinity, Royal Canin and Eukanuba.**

In the case of cats, wet feeding is preferred in combination with dry feed and in dogs and hamsters dry feed and seeds. There is a good acceptance of the quality of these products with **an average of 7.3 out of 10**. 100% of the responses indicate that they are satisfied with the range of products in the Spanish market, the price of these products is not a problem and they consider it should be lower if the products are made with whole fish.

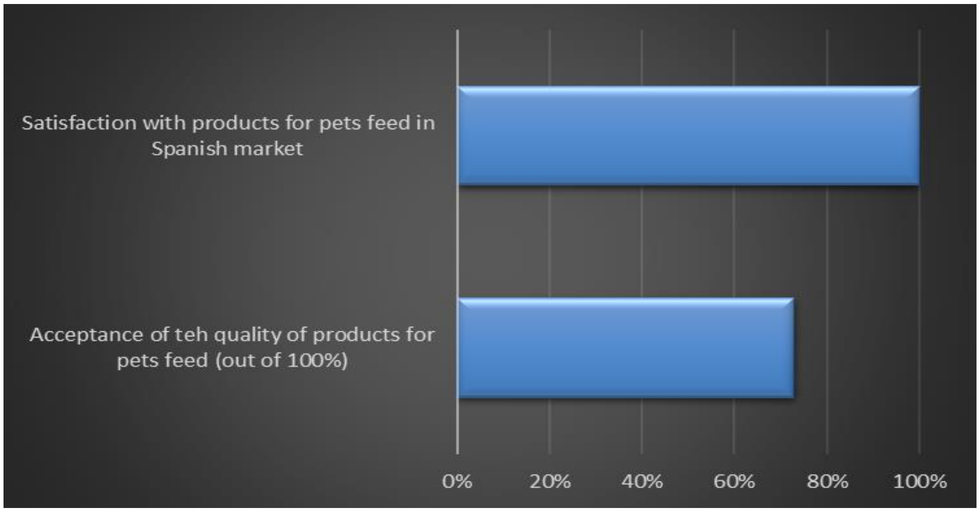


Figure 30: Results on several questions related to pets feed

5. Conclusion

5.1Processed Human Food:

- Wide variety of processed fish products are being consumed by Indian consumers, of which **fish nuggets are most popular ones**.
- Wider product variety were consumed by Spanish participants.
- On a scale of 10 about **71% of the Indian participants gave more than 5 point** to products made from fish-by-products whereas Spanish participants gave on an average of **3.42 on scale of 10.** This indicated a higher chance of acceptability of processed products from fish by-products in Indian market.
- Unanimously all the participants suggested **pricing of by-products-based products should be lower than available options**
- An awareness/ **knowledge gap was observed among consumers** regarding fish by-products. Though on the brighter side when informed about the same, **encouraging responses** were recorded regarding acceptability of fish by-products-based items (food, pet food, health supplements)

5.2Protein Supplements

- Protein in **powdered form was most preferred** form as health supplement among Indian participants whereas Spanish participants preferred **protein bars** most.

5.3 Pet Food

- **Pedigree** was the most consumed brand, however about **56% of the consumer found it expensive**
- **On a scale of 10 about 73% of the participants found fish-based pet food acceptable for their pets.**
- **43% were expected the pricing should be lower than the options available in the market**