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Ideas generation for new aquaculture products (Sea Bream and Prawns) developing using Focus Group by different participants profiles†

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Abstract: The current market requires new fish-based products, in this context, the use of focus groups is a qualitative technique that enables the generation of ideas for the development of new products. The aim of this study is to create a list of ideas of products based on two species from aquaculture: sea bream and prawn. To achieve this, two sessions were conducted, involving 20 individuals from diverse backgrounds. The sessions included consumer surveys, exploration of new products, brainstorming, and categorization of ideas into product categories. As a result, the frequencies of idea mentions were obtained, with the 'fresh products' category being the most frequently mentioned for both species. Furthermore, associations between product categories and participant profiles were established using correspondence analysis (CA). In conclusion, for Sea Bream, consumers showed a preference for fresh product ideas. Conversely, for Prawns, canned and dehydrated products were consistently suggested across all participant profiles. This study lays the foundation for innovative aquaculture product development.

Keywords: seafood, generation of new ideas, product categories, consumers.

1. Introduction

At present, there is a growing concern among consumers about maintaining a healthy and balanced diet [1]. Fish and seafood are considered the primary dietary sources of fatty acids, offering various health benefits [2]. As a result, there has been an increase in the consumption of fishery products in recent decades, and aquaculture plays a significant role in this growth [3]. Aquaculture is considered a complementary alternative to traditional fishing [4]. The development of new aquaculture products presents an opportunity to enhance the commercial value and profitability of the Mediterranean aquaculture value chain [5]. Therefore, it is necessary to offer consumers new aquaculture products to meet their needs. But what type of products do consumers demand? Exploratory techniques such as focus groups are used to gather ideas from customers about promising new products. These groups typically consist of six to ten people and should be conducted at the beginning of the product development process [6]. To achieve idea generation is crucial to identify the key attributes that influence consumer purchasing decisions, which involves collecting preliminary qualitative data to gain a deeper understanding of consumer behavior [7,8]. Given this issue, this study aims to employ the focus group technique to obtain a list of new product ideas in the field of aquaculture, focusing on two species, sea bream and prawn, for subsequent development at the laboratory level as part of Project THINKINAZUL/2021/011."

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2. Materials and Methods

2.1. Participants´ Recruiment

Participants were recruited from different databases available at Instituto Universitario de Ingenieria de Alimentos-FoodUPV (Universitat Politècnica de València, Spain). The chefs were recruited from the Association of Chefs of the Valencian Community (Spain). Participation in the study was voluntary. All the participants met the criteria of being adults, responsible for grocery shopping, and regular fish and seafood consumers, with a frequency of at least once a week.

2.2. Focus Group Sessions

The focus group work sessions took place at the facilities of Instituto Universitario de Ingenieria de Alimentos-FoodUPV (Universitat Politècnica de València, Spain). Two working sessions were conducted, each with a total of 20 participants. The sessions were conducted using two modalities: in-person (for consumers and researchers) and remotely (for chefs). Each group's session lasted 90 minutes [9]. The sessions were led by a moderator and an additional senior laboratory technician who provided assistance during the sessions. The moderator's skill is essential to foster a discussion environment in which all participants can freely express their opinions without being influenced by others [10]. The focus group sessions were carried out in five steps: Step 1, an online survey on the consumption of aquaculture products where participants provided their personal information and data about the frequency of consuming seafood products; Step 2, exploration of recent launches of new food products where they were introduced to their characteristics and keywords that identify them; Step 3, brainstorming of new products for sea bream and prawn; Step 4, grouping of ideas by product categories; and Step 5, analysis of all the ideas where participants were invited to evaluate the generated ideas with the aim of providing additional input. Through this qualitative methodology, the moderator was able to inquire about participants' viewpoints, facilitating a better understanding of the workshop's objective among the participants [9].

2.3 Data analysis

Three researchers (moderator, assistant, and project coordinator) anonymously generated a report listing all the proposed ideas for new products and their respective frequencies. Subsequently, a comparison and discussion of the individual reports were conducted, reaching a consensus on the ideas for new aquaculture products obtained for each species: sea bream and prawn. This evaluation methodology has been previously applied in a study [10, 11]. The following analyses were conducted: a bifactorial statistical analysis (ANOVA) with participant profiles and aquaculture species as factors. The data used for this analysis was the number of generated ideas. Additionally, a correspondence analysis (CA) was conducted on the contingency tables of frequency data for the qualitative variables (ideas for each species), resulting in a multidimensional graphical map or bi-plot [12]. The statistical analysis was performed using XLSTAT 2023.1.6.1410 software [13], and differences were considered significant when $p < 0.05$.

3. Results and Discussion

3.1. Participants' Characteristics

The sociodemographic characteristics of the participants are presented in Table 1. The participants' age range was between 18 to 65 years old. Regarding gender, a balanced distribution similar to the Spanish population was obtained [14]. Data on employment and personal situations were collected to obtain broad opinions and perspectives [9]. In this study, the opinions of consumers (50%), researchers (25%) and chefs (25%) were collected. This method was also carried out in another study [15].

Table 1. Characteristics of the participants in focus group sessions expressed as a percentage.

GENDER		AGE (years old)		EMPLOYMENT SITUATION		FREQUENCY CONSUMPTION		PERSONAL SITUATION	
♀	55%	65 – 100	5%	Student	15%	Daily	10%	Living alone	10%
♂	45%	55 – 64	25%	Unemployed	5%	3-4 times per week	30%	Living with my partner	25%
		45 – 54	25%	Part-time employed	15%	1-2 times per week	50%	Living with my family	50%
		35 – 44	20%	Full-time employed	60%	Once every 2 weeks	10%	Sharing apartment	15%
		25 – 34	20%	Retired	5%				
		18 – 24	5%						

3.2 Focus Group

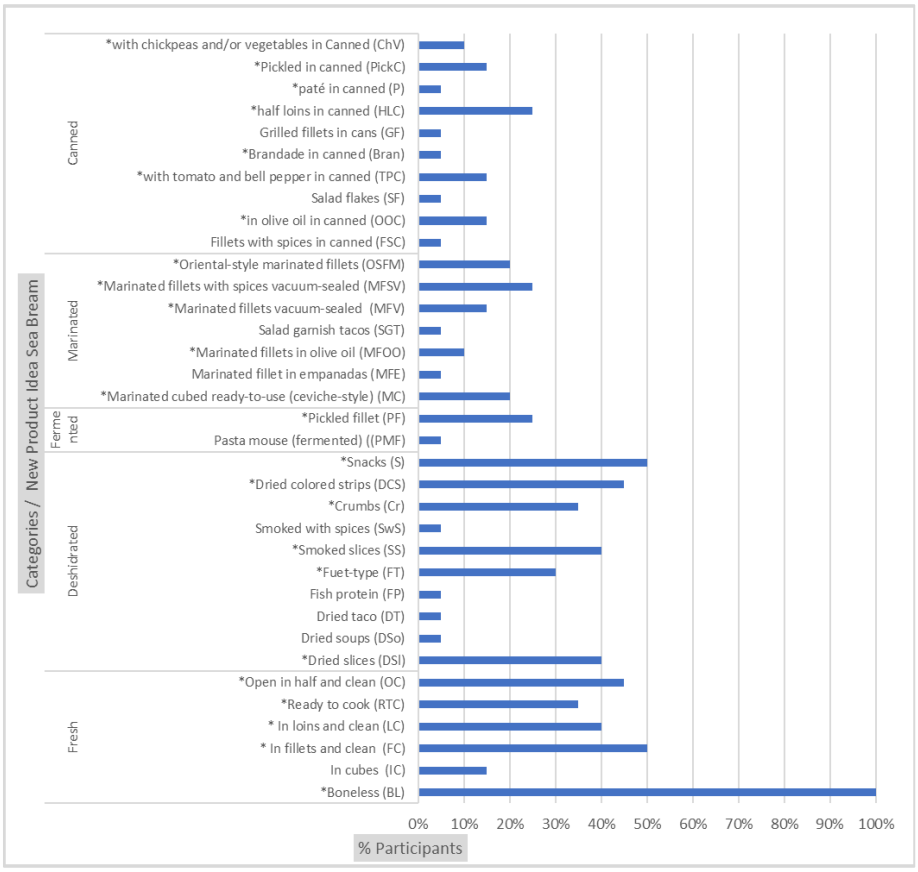
In Figure 1 displays the complete list of generated ideas and the percentage of mention for each idea by participants. A total of 68 new product ideas were generated: 35 for sea bream (Figure 1a) and 33 for shrimp (Figure 1b). These were grouped into product categories (fresh, dehydrated, canned, smoked, and fermented).

Analyzing Figures 1a and 1b, it can be observed that a high number of ideas were generated for sea bream in some cases, with a mention percentage exceeding 40%. Conversely, the generation of new product ideas for prawns reached a maximum of 30%. After conducting an ANOVA, significant differences ($p < 0.05$) were observed between aquaculture species. However, no significant differences were found among participant profiles.

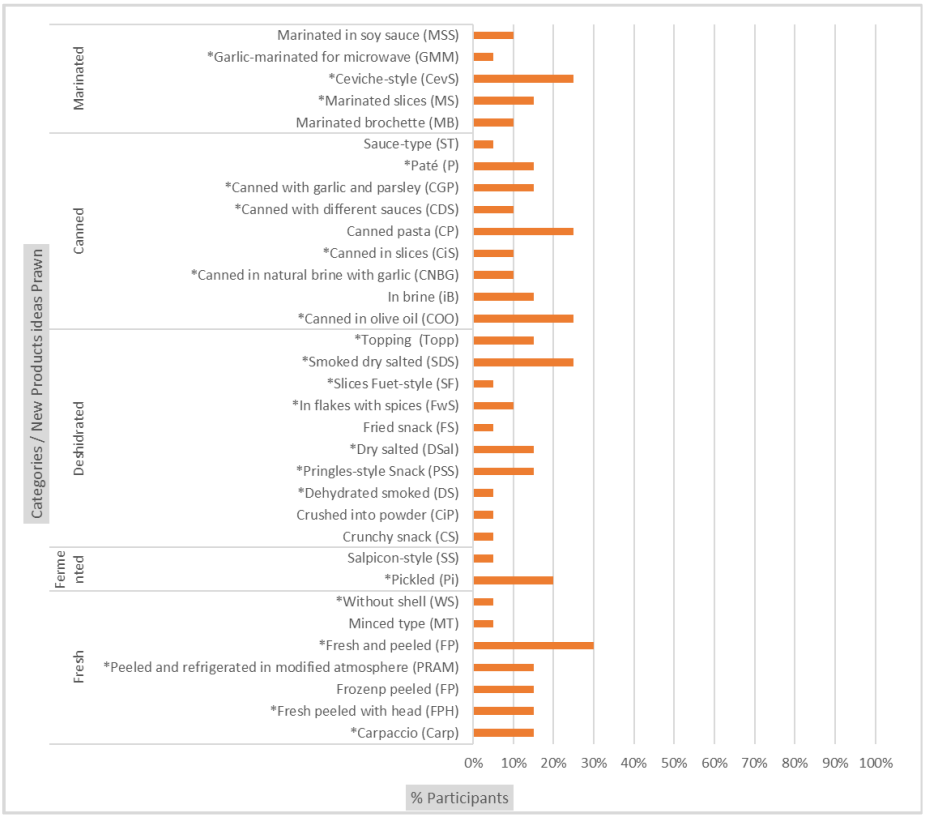
When evaluating the results by product categories, it is observed that participants generated a higher number of ideas for new products in the fresh products category for both species, sea beam (Figure 1a) and prawn (figure 1b). In the case of sea beam, the next category with a higher participation of ideas was dehydrated products. On the other hand, prawns showed a similar percentage of participation across different product categories.

The high percentage of mentión of ideas in fresh products could be due to the fact that according to [2], preservation methods for seafood products (refrigerated, frozen, canned, and smoked/salted) have an impact on consumers, with a progressive decrease in the acceptance of processed products: frozen, canned, and smoked/salted [2]. Additionally, a change in appearance, display, and packaging is also an important aspect to consider in new products [16]. Regarding the dehydrated category in both species (Figures 1a and 1b), mentions of snacks, dehydrated slices, and salted dehydrated products were frequently repeated. There is a high demand for dry and spiced products, as well as their convenient use (easy to consume). Therefore, it is essential to take into account their characteristics, as well as the needs and feedback from users [16]. Many participants, in the canned products category for sea bream (Figure 1a), mentioned options with different flavors (oriental sauce, with vegetables, with legumes). To increase the popularity of value-added fish products worldwide, diversifying products with international flavors, including ethnic flavors, is of great importance [16]. Regarding the marinated category, many of the generated ideas were related to flavors and spices. Marinated products are attractive to consumers due to their distinctive taste and texture properties [16].

After the discussion and consensus work carried out by the evaluators, the proposal for new products ideas were defined. These ideas are indicated with an asterisk (*) on the axis of categories/new product ideas for sea beam (Figure 1a) and prawn (figure 1b). Using the following criteria: unification of similar new product ideas (marinated cubes) canned goods with spices-tomatoes-vegetables, pate-pasta in cans), frequency of word mentions. The textual analysis focuses on the frequencies of keywords, co-occurrence, and contextual meaning [5].



(**a**)

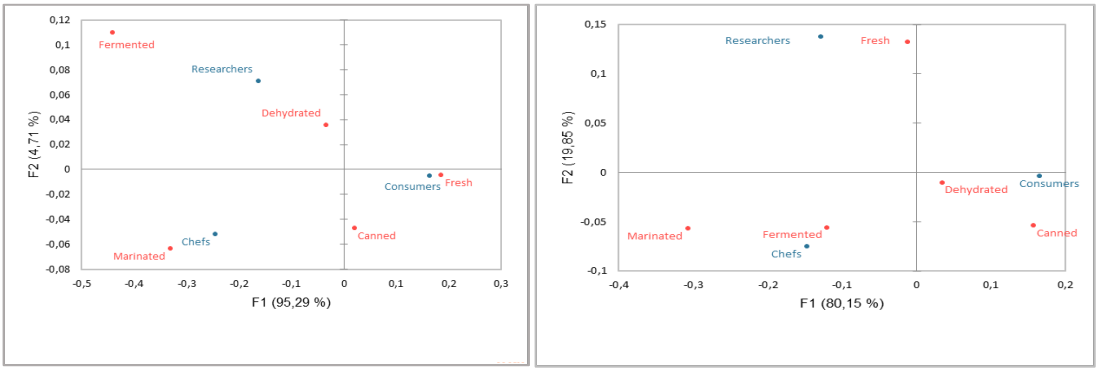


(b)

Figure 1. Frequency percentual of participants in the creation of ideas: (**a**) New Product Ideas Sea Bream; (**b**) New Product Ideas Prawn.

3.3 Projective map

Figure 2 shows a correspondence analysis (CA) of product categories, in which it can be observed that the different profiles of the participants are associated with certain product categories. This allows for the comparison of qualitative variables [13]. In the case of seabream products (Figure 2a), the fresh products category was frequently mentioned by consumers, while the processed products category (dehydrated, marinated, and fermented) was closer to the dimensions of chefs and researchers. In the prawn analysis (Figure 2b), ideas for the fresh products category were cited by researchers, while ideas for the processed products category were situated in the consumers and chefs dimensions. The results of CA allow for a deeper understanding of the associations between supplementary variables in relation to the frequency of obtaining different dimensions [13].



(**a**) (**b**)

Figure 2. Correspondence analysis of product categories: (a) Symmetric graph Sea Bream Products; (b) Symmetric graph Prawn Products.

The frequency of mention is varied according to the type of aquaculture species (prawn and sea beam) by consumers and researchers, suggesting that these participants' profiles hold a different perception of the products. This fact could be related to consumers' interest in "minimally processed" products, especially when it comes to traditional food products [7]. Meanwhile, chefs frequently mentioned processed products regardless of the aquaculture species. It could be assumed that their inclination towards processed products is related to their personality because a chef may be more adventurous in taking or not taking risks to develop their creations [17].

4. Conclusions

In the process of generating ideas for the development of new aquaculture products, specifically sea bream and prawns, the focus group proves to be a valuable tool that allows obtaining a preliminary idea of the products consumers might demand. Depending on the participants' profiles, the mention or demand for types of products (categories) would vary. In the case of sea bream, consumers predominantly mentioned fresh products. However, when referring to prawns, they mentioned canned and dehydrated products. Therefore, in product development, the consumer profile should be considered.

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References

1. Claret, A.; Guerrero, L.; Aguirre, E.; Rincón, L.; Hernández, M.D.; Martínez, I.; Benito Peleteiro, J.; Grau, A.; Rodríguez-Rodríguez, C. Consumer Preferences for Sea Fish Using Conjoint Analysis: Exploratory Study of the Importance of Country of Origin, Obtaining Method, Storage Conditions and Purchasing Price. *Food Qual Prefer* **2012**, p. 26, pp. 259–266, doi:10.1016/j.foodqual.2012.05.006.
2. Carlucci, D.; Nocella, G.; De Devitiis, B.; Viscecchia, R.; Bimbo, F.; Nardone, G. Consumer Purchasing Behaviour towards Fish and Seafood Products. *Patterns and Insights from a Sample of International Studies*. *Appetite* **2015**, p. 84, pp. 212–227.
3. Reig, L.; Escobar, C.; Carrassón, M.; Constenla, M.; Gil, J.M.; Padrós, F.; Piferrer, F.; Flos, R. Aquaculture Perceptions in the Barcelona Metropolitan Area from Fish and Seafood Wholesalers, Fishmongers, and Consumers. *Aquaculture* **2019**, p. 510, pp. 256–266, doi:10.1016/j.aquaculture.2019.05.066.
4. Claret, A.; Guerrero, L.; Gartzia, I.; Garcia-Quiroga, M.; Ginés, R. Does Information Affect Consumer Liking of Farmed and Wild Fish? *Aquaculture* **2016**, p. 454, pp. 157–162, doi:10.1016/j.aquaculture.2015.12.024.
5. López-Mas, L; Claret, A; Stancu, V; Bruns, K; Peral, I; Santa Cruz, E; Krystallis, A & Guerrero, L. New Fish Product Ideas Generated by European Consumers**.** Conference Aquaculture Europe 20 Eposter & e-Market, (12-15, April, 2021).
6. Mcquarrie, E.F.; Mcintyre, S.H. *Focus Groups and the Development of New Products by Technologically Driven Companies: Some Guidelines*. Marketing The University of Santa Clara. Santa Clara. CA Department. 1986
7. Claret, A.; Guerrero, L.; Aguirre, E.; Rincón, L.; Hernández, M.D.; Martínez, I.; Benito Peleteiro, J.; Grau, A.; Rodríguez-Rodríguez, C. Consumer Preferences for Sea Fish Using Conjoint Analysis: Exploratory Study of the Importance of Country of Origin, Obtaining Method, Storage Conditions and Purchasing Price. *Food Qual Prefer* **2012**, p. 26, pp. 259–266, doi:10.1016/j.foodqual.2012.05.006.
8. Byers, P.Y.; Wilcox, J.R. *Focus Groups: A Qualitative Opportunity for Researchers*. University of Miami. 2014. Downloaded from job.sagepub.com
9. Lazo Zamalloa, O. Development of new products from aquaculture fish species. the degree of Doctor from the University of Girona 2017.
10. Juan, S.; Roussos, A. El focus groups como técnica de investigación cualitativa. 2010. Documento de Trabajo N° 256, Universidad de Belgrano. http://www.ub.edu.ar/investigaciones/dt_nuevos/256_roussos.pdf
11. Carrillo, E.; Chaya, C.; Viadel, A.; Laguna, L.; Tarrega, A. Early Changes in Elderly Food Habits Related to Reduced Protein Intake. *Food Qual Prefer* **2023**, p. 108, doi:10.1016/j.foodqual.2023.104862.
12. Stoddard J.; Dotson M.; Das N. Using focus groups and correspondence analysis to explore the relationship between millennials' online behavior and their opinions of online reviews. 2016, *Atlantic marketing journal*; Vol. 5 Num. 2 Art. 4
13. López-Mas, L.; Claret, A.; Stancu, V.; Brunsø, K.; Peral, I.; Santa Cruz, E.; Krystallis, A.; Guerrero, L. Making Full Use of Qualitative Data to Generate New Fish Product Ideas through Co-Creation with Consumers: A Methodological Approach. *Foods* **2022**, *11*, doi:10.3390/foods11152287.
14. Estadística Continua de Población (ECP) a 1 de Abril de 2023 Datos Provisionales
15. López-Mas, L.; Claret, A.; Bermúdez, A.; Llauger, M.; Guerrero, L. Co-Creation with Consumers for Packaging Design Validated through Implicit and Explicit Methods: Exploratory Effect of Visual and Textual Attributes. *Foods* **2022**, p. 11, doi:10.3390/foods11091183.
16. Prakasan S.; Value Added Fish Products. Fish Processing Division. ICAR-Central Institute of Fisheries Technology, Cochin. Recent Technological Developments in Fisheries: Pre and Post Harvest.
17. Lin, P.M.C.; Baum, T. The Meaning of Applied Creativity in the Culinary Industry. *International Journal of Hospitality and Tourism Administration* **2016**, *17*, 429–448, doi:10.1080/15256480.2016.1226153.