

Perceived quality and satisfaction with food on Spanish merchant ships: descriptive analysis based on a survey of crew members

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ABSTRACT

Objective: To characterise satisfaction and perception of food quality on board merchant ships associated with the Spanish sector and to determine the areas for improvement prioritised by crew members.

Methods: Cross-sectional study using a self-administered questionnaire on board ships of different ranks and types. Eighty-one valid responses, collected via an online form, were analysed. A descriptive analysis of frequencies and thematic categorisation of open-ended responses was performed.

Results: The sample consists mainly of males (72.8%) and seafarers between 25 and 35 years of age (48.1%). 77.8% sail under the Spanish flag and the most common duration of a campaign is 2-4 months (44.4%). The food is considered good (42%) or fair (30.9%), with variety being the weakest point (45.7% consider it repetitive). The quantity of food is sufficient for 67.9% and hygiene is good or fair (75.3% in total). 50.6% report that food influences well-being and performance, but 55.6% say that there are no internal evaluation mechanisms or recommendations.

Conclusion: Food on board is generally good, with room for improvement in variety, quality of ingredients and structured feedback. The results support the need for internal policies of continuous evaluation and scheduled menu rotation to reinforce factors related to well-being and motivation in the maritime environment.

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1. Introduction.

Seafarers are a key population for global trade, but they are also a group of workers exposed to particular risks to their physical and mental health. Several studies have shown that seafarers are at greater risk of overweight, metabolic syndrome, type 2 diabetes and hypertension than other transport occupations, closely linked to unhealthy dietary patterns, smoking and sedentary lifestyles on board (Oldenburg et al., 2013; Nittari et al., 2019; Sagaro et al., 2023; Baygi et al., 2022). This condition has been reported in several national navies (e.g., Greek,

European, Pacific) and is a major contributor to cardiovascular risk in seafarers (Zyriax et al., 2018; Neumann, F. A et al., 2021; Sagaro et al., 2023).

Food on merchant ships has its peculiarities: restricted autonomy for crew members to decide what they want to eat, dependence on a single cook or a small team, provisioning subject to distant stopovers, and working hours that interrupt the regularity of meals. Oldenburg et al. (2013) discuss how the diet followed by crews is typically high in calories, rich in fats and sugars, and deficient in fresh fruits and vegetables, and how this, combined with multi-ethnic crews and separate dining areas (officers/crew), creates conditions in which the diet consumed is very unhealthy.

In recent years, studies have been conducted on the nutrition of seafarers, such as the Seafarer Nutrition Study (SeaNut), which compared the food supply and actual consumption of European and Kiribati seafarers, showing high fat consumption, insufficient fibre consumption and high cardiovascular risk

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among Pacific Island seafarers (Zyriax et al., 2018). In addition, recent studies indicate that insufficient or unbalanced nutrition not only impacts physical health, but also mood, anxiety, cognitive function and, ultimately, operational safety on board (Qorbani et al., 2023; Şenbursa, N., 2024).

Concerned about these issues, the European project 'e-healthy ship' analysed the opinions of more than 800 seafarers and 62 cooks on merchant ships belonging to German companies. Their findings show that most seafarers attach importance to healthy eating and would be willing to improve their eating habits on board if changes in provisioning were combined with nutritional education and support for cooks (Neumann et al., 2024). Along the same lines, Correa addresses the logistical, cultural and regulatory challenges of feeding seafarers in the 21st century, with the aim of adjusting the supply to heterogeneous crews and increasingly demanding campaigns (Challenges and Considerations in Seafarer Feeding in the Merchant Marine, 2023).

From a regulatory point of view, the ILO Maritime Labour Convention (MLC, 2006) in its Regulation 3.2 requires flag States to ensure that seafarers are provided with food and drinking water of sufficient quality, nutritional value and quantity, prepared and served in hygienic conditions and, wherever possible, by qualified catering personnel (International Labour Organisation, 2006; Maritime and Coastguard Agency, 2018). Several implementation guides and circulars from maritime administrations and P&I clubs reaffirm these requirements, emphasising the need for nutritious, balanced and culturally appropriate menus, and regular inspection of catering services in MLC audits (Maritime and Coastguard Agency, 2020; UK P&I Club, 2025; Mission to Seafarers, 2021; Safety4Sea, 2020).

Despite this legislation, many reports from shipowners, insurers and welfare organisations show that the actual quality of food on board varies greatly between ships and companies. The UK P&I Club and other industry players indicate that, while the MLC sets a minimum standard, actual implementation depends on the safety culture and budget of each shipping company (UK P&I Club, 2025; OCEANIC / V.Group, 2023).

The relationship between food quality and seafarers' well-being is also evident in global indicators such as the Seafarers Happiness Index (SHI), a quarterly survey that measures seafarers' satisfaction in different areas, including food. The latest SHI reports reveal that the score for food on board is generally average, with large differences between ships and with lack of variety and poor quality being common complaints (ISWAN & The Mission to Seafarers, 2024; Safety4Sea, 2021). The SEAFiT Crew Survey 2024 on the physical, mental and social well-being of seafarers repeatedly mentions nutrition as one of the main factors for increasing satisfaction and resilience on board (Sampson et al., 2019; UK P&I Club, 2025).

At the same time, several organisations in the sector have developed specific programmes to improve nutritional standards, such as the World Maritime University's Food4Seafarers programme, supported by the ITF Seafarers' Trust, to investigate actual catering expenditure, deficiencies in food quality and make global recommendations to ensure that quality food is the rule rather than the exception (Safety4Sea, 2021; UK P&I Club,

2025). The International Seafarers' Welfare and Assistance Network (ISWAN) has also recognised in its reports on the importance of food on cargo ships that food is a factor in crew welfare and cohesion (International Seafarers' Welfare and Assistance Network, 2024; ISWAN & The Mission to Seafarers, 2024).

However, despite this growing number of international scientific articles, there are still few studies focusing on Spanish seafarers, both in terms of cardiovascular risk and perception of food, that would allow for the development of interventions tailored to our environment (Challenges and Considerations in Seafarer Feeding in the Merchant Marine, 2023; Hjarnoe & Leppin, 2014). While accurate information is available on fleets flying the flags of Nordic countries, Germany, Greece and small Pacific island states, information on the quality and satisfaction of food on merchant ships sailing from or under the Spanish flag is scarce and scattered.

In this context, it is of interest to have research that evaluates, from the seafarers' perspective, the quality, quantity, variety and nutritional adequacy of food on board and its perceived effect on well-being and work performance. A specific study of crews operating on Spanish-flagged merchant ships can not only verify their compliance with MLC 2006, but also identify specific improvement measures that can be incorporated into shipping companies' internal policies and the specific training of ship's cooks. This study falls within this framework, providing up-to-date empirical evidence on seafarers' satisfaction with food on Spanish merchant ships and filling the gap found in the literature.

2. Methodology

2.1. Study design

A descriptive cross-sectional study was conducted using an online questionnaire aimed at merchant seafarers with recent campaign experience. Participation was voluntary and anonymous.

2.2. Participants

A total of 81 complete responses were received, including crew members of different professional ranks (from trainees to captains) on board cargo and passenger ships in regular service or ro-pax ships.

2.3. Data collection tool

The questionnaire included 28 closed and open questions distributed across:

- sociodemographic data,
- type of vessel and campaign,
- assessment of food service,
- satisfaction and perceptions of well-being,
- suggestions and free comments.

2.4. Key variables.

- **Independent:** vessel type, campaign, rank, flag.
- **Dependentntes:** perceived food quality, satisfaction, balance, variety, hygiene, impact on wellbeing.

2.5. Data Analysis.

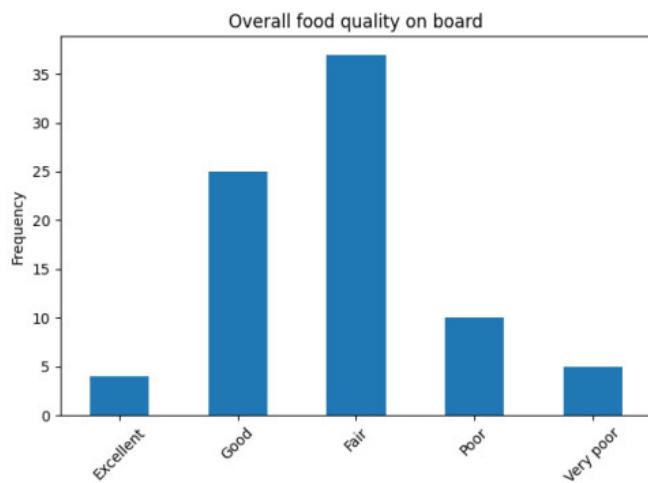
Descriptive analysis (frequencies and percentages) was used. Open-ended responses were categorised inductively into recurring themes: variety, ingredient quality, cooking techniques, budget, hygiene, and additional availability.

3. Results.

A total of 81 valid responses were obtained from crew members belonging to different types of merchant ships linked to the Spanish sector. In general terms, the assessment of the quality of food on board showed a predominance of intermediate responses, with a majority rating it as fair (45.7%) or good (30.9%). The most positive (excellent) and most negative (very poor) categories were in the minority (4.9% and 6.2%, respectively), while 12.3% considered it poor.

These results reflect a largely neutral perception of food quality, indicating room for improvement without a generalised feeling of extreme dissatisfaction.

Figure 1: Overall perceived quality of food on board.

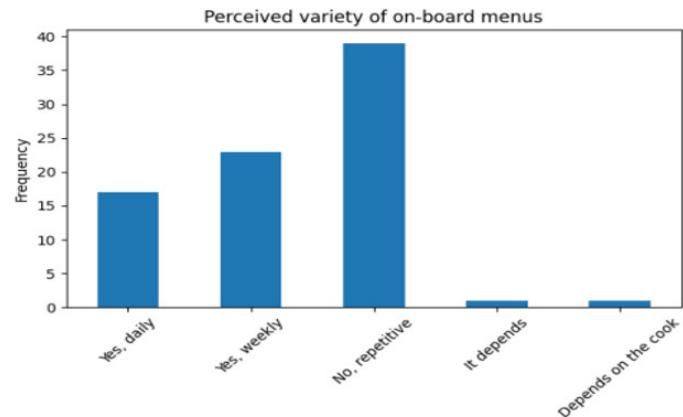


Source: Authors.

With regard to menu variety, the pattern found is more pronounced: the option 'No, it is repetitive' was the most selected (48.1%), followed by 'Yes, every week' (28.4%) and 'Yes, every day' (21.0%). Only 2.4% of respondents answered 'It depends' or 'It depends on the cook'.

This finding confirms that monotony in meal planning is one of the main areas of dissatisfaction and coincides with previous assessments by the Seafarers Happiness Index, where lack of variety appears as a recurring criticism.

Figure 2: Perception of variety in menus served on board.

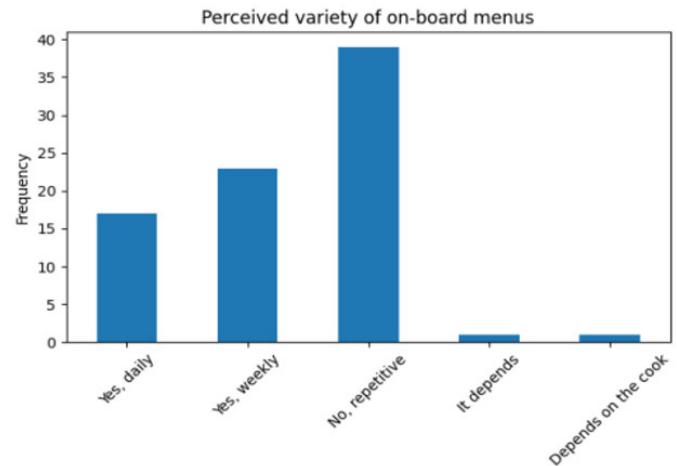


Source: Authors.

In terms of perceived food hygiene and safety, the results show a distribution similar to that of overall quality: most responses fall within the fair (38.3%) and good (37.0%) categories, while excellent accounts for 11.1%, poor for 8.6% and very poor for 4.9%.

These values suggest that, although hygiene is not perceived as deficient in general terms, the absence of a clearly positive majority indicates room for improvement in procedures, communication or compliance with MLC standards, especially on ships with rotating kitchen crews.

Figure 3: Perception of hygiene and food safety on board.



Source: Authors.

Table 1: Quantitative summary of the main indicators.

Evaluated Indicator	Predominant Category	%	Key Interpretation
Overall quality	Fair	45.7%	Moderate satisfaction, room for improvement
Variety	No, it is repetitive	48.1%	Generalized monotony in menus
Hygiene	Fair	38.3%	Adequate but without perceived excellence

Source: Authors.

3.1. Overall interpretation of results.

Overall, the data indicate that the three core indicators evaluated -quality, variety, and hygiene- are mostly concentrated in intermediate perceptions, with positive and negative values in minority proportions.

Variety appears to be the most critical aspect, which is consistent with previous international studies and suggests a possible short-term intervention: cyclical menu rotation + greater planning of supplies + standardisation between kitchen shifts.

4. Discussion.

The results indicate that satisfaction with food on board merchant ships in the Spanish sector is average in most of the aspects analysed, especially in terms of overall quality, perceived hygiene and menu variety. This pattern is consistent with previous research showing that, although the food meets the minimum regulatory requirements of MLC 2006, there are significant differences between ships and companies in the way they plan, diversify and apply standards (UK P&I Club, 2025; International Labour Organisation, 2006; Maritime and Coastguard Agency, 2018; Maritime and Coastguard Agency, 2020).

First, the majority perception of 'fair to good' quality and hygiene found in this study is in line with evidence showing a generally acceptable perception of the food served on board, but without reaching widespread excellence (Oldenburg et al., 2013; Baygi et al., 2022; Şenbursa, N., 2024). This situation may be related to the logistical nature of maritime resupply -extensive rotations, storage restrictions, and variable availability of fresh produce- already documented internationally (Zyriax et al., 2018; Neumann, F. A et al., 2021; Neumann, F. A et al., 2021; Russo et al., 2023). The existence of extreme minority scores (very good and very bad) also indicates high variability associated with the ship, cook or supply routes, in line with the inter-ship differences found in the Seafarers Happiness Index (ISWAN & The Mission to Seafarers, 2024).

Secondly, the monotony of the menus is the main complaint. The fact that almost half of the respondents find the menus repetitive is consistent with other studies that point to food monotony as one of the main complaints among seafarers, even when the quantity and basic quality are assured (Neumann et al., 2024; Hjarnoe & Leppin, 2014; Challenges and Considerations in Seafarer Feeding in the Merchant Marine, 2023). Monotony can lead to a loss of interest in food, resulting in nutritional imbalances and unhealthy dietary patterns, as seen in nutritional studies of European and Pacific seafarers (Zyriax et al., 2018; Zyriax et al., 2018; Nittari et al., 2019). These findings reaffirm the need, already recognised by initiatives such as Food4Seafarers and other industry guidelines, to establish cyclical menu rotations and promote ongoing training for cooks on board (Safety4Sea, 2021; UK P&I Club, 2025; HOMED Medical Clinic, 2024).

Thirdly, the average perception of food hygiene -although mostly acceptable- reveals that the crew does not always recognise compliance with standards as an ever-present and obvious practice. This is important because food hygiene practices on

board not only affect food safety but also influence seafarers' confidence in the ship's catering service (Maritime and Coastguard Agency, 2018; Mission to Seafarers, 2021). According to the existing literature, the visibility of hygiene practices can influence the perception of overall quality, beyond technical execution (International Labour Organisation, 2006; International Maritime Health Foundation Expert Panel, 2020).

Finally, the results should be interpreted from the perspective of crew well-being. Scientific evidence suggests that dietary patterns considered unsatisfactory can affect mood, fatigue and cognitive function, which can impact performance in critical operational tasks (Qorbani et al., 2023; Baygi et al., 2022; Jørgensen et al., 2025). In line with this, the mostly intermediate perception found in this study aligns with the Seafarers Happiness Index, where food is an important but unresolved factor in seafarers' overall satisfaction (ISWAN & The Mission to Seafarers, 2024; Sampson et al., 2019).

Overall, the results of this study indicate that food on board Spanish merchant ships meets minimum standards but lacks variety and consistency in the use of good practices. These results support the need for internal policies of regular evaluation, rotating menu planning, improved culinary training, and initiatives to make hygienic practices more visible and ensure crew participation in food service feedback. These actions could bring the crew's perception into line with regulatory standards and recommendations found in the international scientific literature.

Conclusions.

The results of this research indicate that the assessment of food on Spanish-flagged merchant ships is average in terms of quality, variety and hygiene, with monotonous menus being the main cause of dissatisfaction. This conclusion is in line with international literature, which recognises food repetitiveness as a prevalent constraint in the maritime sector and is associated with a lack of interest in diet and a decrease in the consumption of fresh foods.

In practical terms, the results indicate that the most feasible and impactful improvements do not involve greater financial resources, but rather a reorganisation of food planning and internal feedback mechanisms. Specifically, establishing rotating menu cycles, varying cooking techniques and using fresh products according to resupply windows are strategies that could improve the perception of variety without modifying the structure of the ship.

In addition, the favourable but not entirely satisfied opinion on food hygiene indicates that the visibility and communication of food safety procedures may be as important as their implementation. In this context, making hygiene routines and compliance with standards visible could help build confidence among the crew, developing more positive attitudes towards food service.

The study also points to the need to formalise internal food assessment, for example through regular surveys or anonymous feedback mechanisms at the fleet level. These tools, already

identified in sector roadmaps, would make it possible to identify anomalies between ships and adapt food management on the fly, enabling data-driven decision-making in operations and logistics departments.

Taken together, the findings support the idea that food on board is a strategic element for crew well-being and motivation, with the potential to impact both satisfaction and long-term health indicators. ‘Moving towards more standardised, transparent and participatory maritime catering models can improve perceptions of quality, strengthen crew cohesion and ultimately increase the operational resilience of the vessel within the existing regulatory framework.

Limitations of the study.

There are some things that this study can’t do that you should keep in mind when you look at the results. First, non-probabilistic self-selection sampling was used, which means that the results only show what the seafarers who chose to take part in the study thought and can’t be used to make generalizations about all Spanish merchant seafarers. Also, even though the sample size is good for an exploratory description, the way the participants are split up by ship type and professional rank makes it impossible to make statistical comparisons between subgroups without the risk of bias because the sizes are not equal.

Second, the data come only from self-reports, so people’s answers may be affected by how they see things, how they want to be seen, or how they remember things. There were no objective measurements of the diet on board, like ration weights, direct nutritional analysis, or quantified hygiene inspections. This makes it impossible to link the diet to real nutritional indicators. We also couldn’t get budget data, so we couldn’t figure out how economic investment affects how the crew sees things.

Third, the analysis only looks at the Spanish case and ships with certain operational characteristics. This means that the results should be taken with a grain of salt when applied to fleets of other flags, especially in places where ports are far apart or crews have very different cultures.

Despite these limitations, the study offers a contemporary empirical perspective on food satisfaction aboard merchant vessels linked to the Spanish sector and delineates specific actionable factors.

Future lines of research.

Among the results found, some lines for future research are highlighted. One avenue would be to expand the study to a probabilistic or stratified sample by vessel type and route, which would allow for comparisons between operational segments and improve generalisation. In addition, future research could combine objective measures of nutritional quality (e.g., caloric analysis, macronutrients, or compliance with dietary guidelines) to compare perception with nutritional reality.

Another interesting line of research would be to study provisioning practices and their influence on variety, such as the frequency of stopovers, storage restrictions, or the suppliers used,

in order to determine the structural factors that determine the repetitiveness of menus. Following the current literature, it is also relevant to analyse the association between food as it is perceived, indicators of psychological well-being and measures of operational performance, to the extent that diet may be contributing to the well-being of the crew.

It would also be interesting to design controlled interventions, such as the implementation of cyclical menus, reinforcement of culinary training on board, or systematised internal feedback, and subsequently measure their impact on crew satisfaction. Finally, comparing the results with fleets from other flags or major gastronomic cultures could contextualise the Spanish situation within the international landscape and identify practices that could be transferred.

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