



Funded by
the European Union

Erasmus+ Programme –Cooperation
partnerships
Project No.:
2023-1-RO01-KA220-VET-000156711



CUL-MAR-Skills

MARitime Soft Skills for Onboard Healthy Nutrition

and

CULinary Arts in Seagoing Services

“ONBOARD HEALTHY NUTRITION”

RESEARCH REPORT



CPMR
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INTRODUCTION

People have built ships and spent long periods at sea for different reasons such as exploring new places, trading, migrating, fighting, and sometimes acquiring colonies. During this time, they had to struggle with many difficulties caused by being away from land, their families, and everything they loved. But perhaps the greatest of these challenges was the difficulty they had in finding fresh and sufficient food. This is because the difficulties in this regard were directly related to their health, and they were in danger of losing their health or even their lives due to malnutrition.

In the past, it was extremely important to ensure that the food on board did not spoil and lasted for a long time during long and difficult journeys. If the necessary precautions were not taken, the food in the humid environment would rot or be wormed in a short time. In addition, the rats on board were the main enemy of these foods. In addition to rats haunting these foods, the feces of these creatures could contaminate the food. This led to the emergence of epidemics on board.

In the harsh working conditions for sailors, hard and nutritious products were always the food of choice. In the conditions of the period, hard and dry foods were generally preferred. For example, Egyptian sailors used to carry millet bread, which was flat in shape, with them. The famous King Richard III of England took a kind of bun made of rye, barley, and beans with him for his expedition.

In the old period, rusks, the most preferred product on ships, were specially baked twice. Products intended for use on longer voyages were baked four times. These rusks were usually made with products such as beans, barley, wheat, corn, and chickpeas. Only for captains, rusks were made from special plain flour. In addition, rusks were made 6 months before the voyage.

The only negative side of these rusks, which were specially prepared to withstand harsh conditions, was that they were extremely hard and sometimes broke the teeth of those who ate them. To eat these rusks, sailors had to soften them with products such as coffee or brine. The crumbled rusks were usually used in fish soup.

Very hard rusks usually soften over time due to the humidity in the sea. Unfortunately, while this was happening, the products would get worms. However, even these worms had an important place for sailors who were malnourished under the conditions of that period. To keep the insects away from these rusks, a fish was usually placed on the products and then this fish was thrown into the sea.

Special methods were used for meat and fish, which were important food products. For these products to last for a long time, methods such as salting, drying, processing, or pickling were preferred. Wooden barrels

or crates were usually used to prevent spoilage in sea conditions. Many types of meat were preferred. Pork, beef, and even horse meat were preferred in the conditions of the time. Sometimes live animals were carried on ships to meet the need for food. These animals were slaughtered and consumed when needed.

In the conditions of the period, the problem of balanced nutrition was often experienced and sailors in the crew lost their lives. In 1588, the daily diet for the Royal Navy was 1 pound of rusks and 1 gallon of beer. These were very inadequate nutrients for a human being and the lack of these nutrients often caused scurvy in sailors. In addition to this, many fatal diseases were also experienced. On long voyages, almost half of the crew would die from vitamin C deficiency.

Robert Blyht, a senior curator of world and maritime history from the Royal Museums Greenwich says that a killer condition of long sea voyages was scurvy. It was caused by the lack of vitamin C. It caused joints to swell, teeth to fall out and ultimately killed the seaman. It occurred on long voyages where supplies of fresh fruit and vegetables were hard to find. It could start with you feeling generally tired, listless, and getting confused but what was happening was the cells beginning to break down and the nervous system was not working properly because of a lack of vitamin C. A scurvy-ridden ship is doomed. There were lots of other symptoms of scurvy: Sailors feel extremely nostalgic or homesick they can suffer from something called calenture where they suddenly think that the rolling waves are rolling hills and fields, so simply step off the ship in confusion thinking they are going to stroll through the countryside [1].

The products that 19th-century sailors could consume were quite limited. Dry foods and salted meats were generally consumed. In addition, oil, fish, cheese, beans, and similar foods were rarely consumed. Sailors generally preferred rusks as bread. This is because the product is both more durable and has a higher nutritional value. Fresh vegetables and fruits were taken on board before the voyage, but they were consumed immediately at the beginning of the voyage. Sometimes, when they had the chance to land during the voyage, they would buy fresh fruit and vegetables again, but this was very rare.

Illnesses Caused by Lack of Food

To preserve vegetables for a long time, sailors preferred the drying method. Especially on long voyages, sailors were given a certain number of dried vegetables to supplement their diet. One of the most durable foods for long sea voyages was dried legumes. In the Far East, the most suitable legumes for sailors were rice. The fact that rice was extremely durable and abundant in the region ensured that sailors consumed this food in excess. However, sailors who consumed too much of this food also developed vitamin B1 deficiency and a disease called beriberi emerged among sailors.

Another method preferred by sailors to preserve vegetables was to pickle them. It was known that especially German sailors learned this method from the Turks. Sailors who consumed plenty of pickles were saved from scurvy, which was quite common at that time. Captain Cook was the first to realize that sauerkraut provided a protective effect, especially against this disease. In time, sauerkraut was replaced by lemon, which provided the same protective effect.

Fresh vegetables and fruits were taken on board before the voyage, but they were consumed immediately at the beginning of the voyage. Sometimes, when they had the chance to land during the voyage, they would buy fresh fruit and vegetables again, but this was very rare. Sometimes butter and cheese were among the products given to sailors on voyages to meet their calcium needs. Of course, due to the difference in rank on board ships, pages were given much less of such products than officers. The cheese was sealed with beeswax to preserve it and kept at the appropriate room temperature. Unfortunately, the same method could not be applied to butter, which would quickly spoil.

One of the most interesting things that sailors ate to survive was gunpowder. From time to time, it was sprinkled on products such as cheese to meet their needs. The British used gunpowder instead of salt in the early 19th century [2].

Another important problem during long sea voyages was the storage of drinking water. These waters, kept in barrels under harsh conditions, would usually spoil after a few weeks and become undrinkable. Nevertheless, the crew had no choice but to drink this water. Most of the time, sailors contracted diseases such as typhoid, dysentery, and cholera from this water. For this reason, the most important thing for sailors who set foot on land was to find clean water. On ships, alcoholic drinks were much more durable than water and could remain intact for a long time. For this reason, a certain amount of alcohol was given to the crew until the alcohol stock was exhausted. Rum alcohol was sometimes added to the spoiled water to make it drinkable.

Unfortunately, until the introduction of canned foods, the most important food for sailors was pickled meats and rusks. In 1814, the first canned meats were introduced to the market. Since these canned meats were preserved in tin cans, they were extremely durable during long voyages and could meet sailors' daily nutritional needs. For this reason, it quickly became an indispensable food for sailors. The only negative situation with canned food was that the lids were soldered with lead, resulting in the fatal poisoning of sailors from this lead.

In the 19th century, another storage method on board ships was refrigeration. For this, ice molds were used, the melting of which was slowed down by using special substances. Food preserved in these ice molds was a very effective method of preservation. For ordinary ships, this method was extremely expensive and

impractical. For this reason, they did not get enough efficiency from this method. By the early 20th century, refrigerators and cold air systems had finally been developed and used on ships to prevent spoilage. Thanks to these products, food, and drinks could be kept on board ships for a long time without spoiling [3].



Galley on board an old ship [4]

It is vital to attach importance to and make positive steps in food, which is important for seafarers and affects their well-being and therefore their motivation, psychological state, and productivity. The framework for strengthening the steps taken in this regard and formally establishing rules on the issue is provided for in Title 3 of the internationally recognized Maritime Labor Convention. In other words, the Maritime Labor Convention* has a special title dedicated to Accommodation, Recreational Facilities Food, and Catering (Title 3). The following part comes from this title.

(*Maritime Labour Convention, 2006, as amended (MLC, 2006)

(Entry into force: 20 Aug 2013) Adoption: Geneva, 94th ILC session (23 Feb 2006) - Status: Up-to-date instrument (Technical Convention) [5].

MARITIME LABOR CONVENTION

Title 3 - Accommodation, Recreational Facilities Food, and Catering

Regulation 3.2 – Food and Catering

Purpose: To ensure that seafarers have access to good quality food and drinking water provided under regulated hygienic conditions

- 1. Each Member shall ensure that ships that fly its flag carry on board and serve food and drinking water of appropriate quality, nutritional value, and quantity that adequately covers the requirements of the ship and takes into account the differing cultural and religious backgrounds.
- 2. Seafarers on board a ship shall be provided with food free of charge during the period of engagement.
- 3. Seafarers employed as ships' cooks with responsibility for food preparation must be trained and qualified for their position onboard the ship.

Standard A3.2 – Food and catering

- 1. Each Member shall adopt laws and regulations or other measures to provide minimum standards for the quantity and quality of food and drinking water and for the catering standards that apply to meals provided to seafarers on ships that fly its flag and shall undertake educational activities to promote awareness and implementation of the standards referred to in this paragraph.
- 2. Each Member shall ensure that ships that fly its flag meet the following minimum standards:
 - (a) food and drinking water supplies, having regard to the number of seafarers on board, their religious requirements and cultural practices as they pertain to food, and the duration and nature of the voyage, shall be suitable in respect of quantity, nutritional value, quality, and variety.
 - (b) the organization and equipment of the catering department shall be such as to permit the provision to the seafarers of adequate, varied, and nutritious meals prepared and served in hygienic conditions; and
 - (c) catering staff shall be properly trained or instructed for their positions.
- 3. Shipowners shall ensure that seafarers who are engaged as ships' cooks are trained, qualified, and found competent for the position under requirements set out in the laws and regulations of the Member concerned.

- 4. The requirements under paragraph 3 of this Standard shall include the completion of a training course approved or recognized by the competent authority, which covers practical cookery, food and personal hygiene, food storage, stock control, environmental protection, and catering health and safety.
- 5. On ships operating with a prescribed manning of less than ten which, by virtue of the size of the crew or the trading pattern, may not be required by the competent authority to carry a fully qualified cook, anyone processing food in the galley shall be trained or instructed in areas including food and personal hygiene as well as handling and storage of food on board ship.
- 6. In circumstances of exceptional necessity, the competent authority may issue a dispensation permitting a non-fully qualified cook to serve in a specified ship for a specified limited period, until the next convenient port of call or for a period not exceeding one month, provided that the person to whom the dispensation is issued is trained or instructed in areas including food and personal hygiene as well as handling and storage of food on board ship.
- 7. In accordance with the ongoing compliance procedures under Title 5, the competent authority shall require that frequent documented inspections be carried out on board ships, by or under the authority of the master, with respect to:
 - (a) supplies of food and drinking water.
 - (b) all spaces and equipment used for the storage and handling of food and drinking water; and
 - (c) galley and other equipment for the preparation and service of meals.
- 8. No seafarer under the age of 18 shall be employed or engaged or work as a ship's cook

Guideline B3.2 – Food and catering

Guideline B3.2.1 – Inspection, education, research, and publication

- 1. The competent authority should, in cooperation with other relevant agencies and organizations, collect up-to-date information on nutrition and on methods of purchasing, storing, preserving, cooking and serving food, with special reference to the requirements of catering on board a ship. This information should be made available, free of charge or at a reasonable cost, to manufacturers of and traders in ships' food supplies and equipment, masters, stewards, and cooks, and to shipowners' and seafarers' organizations concerned. Appropriate forms of publicity, such as manuals, brochures, posters, charts, or advertisements in trade journals, should be used for this purpose.

- 2. The competent authority should issue recommendations to avoid wastage of food, facilitate the maintenance of a proper standard of hygiene, and ensure the maximum practicable convenience in working arrangements.
- 3. The competent authority should work with relevant agencies and organizations to develop educational materials and on-board information concerning methods of ensuring proper food supply and catering services.
- 4. The competent authority should work in close cooperation with the shipowners' and seafarers' organizations concerned and with national or local authorities dealing with questions of food and health and may where necessarily utilize the services of such authorities.

Guideline B3.2.2 – Ships' cooks

- 1. Seafarers should only be qualified as ships' cooks if they have:
 - (a) served at sea for a minimum period to be prescribed by the competent authority, which could be varied to consider existing relevant qualifications or experience.
 - (b) passed an examination prescribed by the competent authority or passed an equivalent examination at an approved training course for cooks.
- 2. The prescribed examination may be conducted, and certificates granted either directly by the competent authority or, subject to its control, by an approved school for the training of cooks.
- 3. The competent authority should provide for the recognition, where appropriate, of certificates of qualification as ships' cooks issued by other Members, which have ratified this Convention or the Certification of Ships' Cooks Convention, 1946 (No. 69), or other approved body.



CUL-MAR-SKILLS PROJECT



The **CUL-MAR-Skills** project, officially known as "MARitime Soft Skills for Onboard Healthy Nutrition and CULinary Arts in Seagoing Services," is an initiative under the Erasmus+ program. This project focuses on improving the culinary and nutritional skills of maritime personnel, particularly those responsible for food preparation and logistics onboard merchant ships, Navy vessels, and cruise lines.

Maritime is a sector of great importance in terms of world trade, tourism, and transportation. One of the prerequisites for smooth working in this field is for seafarers to have a peaceful working environment. The food onboard a ship has the primary role of ensuring good nutrition and well-being. There is also a secondary benefit, the psychological effect which can promote mental well-being, reduce stress, and promote camaraderie. A happy well-fed crew will have a very positive effect on the safe and efficient running of the ship. A healthy, nutritious, and low-fat food program provides seafarers with the required energy to perform their duties, protect their health, and fight any fatigue symptoms. Here, the pleasing role of food emerges, and this effect is felt in the same way in all sectors. With this feature, the cooking profession appeals to all sectors. That is, it is possible to say that the culinary profession is a valid profession in every sector and everywhere, and people with culinary skills can easily find a job in every sector.

Considering the importance and necessity of cooking skills, it is obvious that a module that will provide these skills and give people the chance to find a job in the maritime sector more easily is extremely necessary. CUL-MAR-Skills is a project that has set out to create such a module.

Taking the importance and necessity may give a chance to people to work onboard a ship that means they will take the first step in the maritime profession with the basic education and training in procurement for the galley, victualling, and cooking provided by module if they plan to take other steps appropriately, they can lay the foundations for a brand new and highly sought-after profession. In short, the project will include not only the students but also people from all walks of life and allow them to get the education and training highly required by the market and finally give them a new job. Our motivation for the project is to create a new, innovative, and joint curriculum to provide the participants with a sound education and training based on three pillars. The first of them is to promote healthy nutrition on board, which will give the participants an outline of the framework for proper nutrition on board and menu planning in addition to raising

awareness of seafarers on proper nutrition. Second, consists of basic education for the victualling services and food logistics on board the ships, which will provide the participants with knowledge on supply chain management for the galley, how to prevent food waste on board, and how to be environmentally friendly in the galley, in addition to providing them with entrepreneurship and management skills with an emphasis in victualling services. It focuses on equipping students with the necessary tools and competencies needed to come up with creative and innovative ideas to be both entrepreneurs and intrapreneurs in the maritime sector. The third pillar focuses on culinary arts, which covers the activities to give students cooking skills with an emphasis on marine cuisine

Enhancing the creativity of the participants, providing them with entrepreneurial and managerial skills, boosting friendship among nations, and sharing cultural heritage is only possible through the cooperation and interaction of the youth. Since they will work together in the galleys, there will be an emphasis on teamwork as well as cultural interaction, which naturally increases creativity. Over and above this, eventually, the project will contribute to the motivation of the seafarers positively. Seafarers work under unique conditions, that's why it is necessary to relax and boost their mood with something they like - good nutrition and delicious food is something that not only keeps them healthy and strong but also boosts their morale and makes them feel good.

Overall, the CUL-MAR-Skills project is designed to provide a comprehensive education to galley personnel, equipping them with the necessary skills to handle the demands of maritime cuisine while also fostering a healthy and diverse onboard diet. The activities necessary to realize the aims of the project will be carried out in four different work packages. The three surveys that were prepared and analyzed to determine the content of the module were applied within the frame of Work Package 2.

WORK PACKAGE 2 (WP 2)

Introduction

The objective of WP2 was to analyze the current state of knowledge of people related to seagoing jobs in the maritime sector on healthy nutrition.

It was intended to cover the common dietary patterns and habits among seafarers, assess the nutritional status and requirements of seafarers, and evaluate the effectiveness of existing nutrition programs and policies on board. The report will be prepared on the results of the survey within the frame of the work package and expert reports on healthy nutrition on board. The report will also provide insights into the barriers and challenges to maintaining a healthy diet at sea, as well as the potential benefits and outcomes

of promoting healthy nutrition among seafarers. Ultimately, the study will inform the development of evidence-based strategies and interventions to improve the nutrition and health outcomes of seafarers on board.

Based on the report, the training module” Onboard Healthy Nutrition” and the respective curriculum will be designed. An online textbook for the course will be prepared. It will include visuals and a question/ answer section at the end of each unit. In addition, all units in the book will have PowerPoint presentations and training on-hand case studies to make them easier to use in the lessons. The WP2 will be completed with dissemination meetings and with one Learning, Teaching, and Training (LTT) to be delivered to the trainers.

The Key Activities

1. 3 surveys for 3 different stakeholder groups:

i. The preparation of the surveys:

The partners designed three surveys for three groups: 1. students and seafarers, 2. galley staff, and 3. employers. The surveys were specially prepared for the groups considering their needs, habits, and the correct behaviors they are expected to have depending on the topic the question addresses to. The surveys for students and seafarers and for galley staff asked demographic questions first. Then they covered the following topics:

For students and seafarers:

- Proper Nutrition, and Well-Being
- Sustainability
- Hygiene
- Effects of Good Food
- General Impression

For galley staff:

- Proper Nutrition, and Well-Being
- Sustainability
- Hygiene
- Victualling

- Training and Education
- Challenges

For employers:

- Proper Nutrition, and Well-Being
- Sustainability
- Hygiene
- Training and Education
- Challenges

The number of questions each survey contained was different. The first survey intended for students and seafarers contained 20 questions, the second one for the galley staff had 23 questions and the last one prepared for employees had 15 questions. The responses were given on a 5-point Likert scale, changing from “Completely Disagree” to “Completely Agree”.

ii. Distribution of the surveys:

The surveys were created in Google Forms and distributed electronically through the networks of each partner to gather international data. Originally, the surveys were all prepared in English and partners translated them into their language if they found it necessary. Then the surveys in different languages were merged and a single result file was created.

321 participants responded to the survey for students and seafarers while 55 galley staff participated in the survey for galley staff, and 19 participants took the survey for employers.

iii. Analysis of the collected data

Each question in the surveys was intended to measure a certain feature. The following table shows the distribution of questions according to the topics.

The topics that the questions are intended to measure		
SEAFARERS AND STUDENTS	GALLEY STAFF	EMPLOYERS
Demographic questions 1-7	Demographic questions 1-5	Proper Nutrition and Well-Being 2- 3-6
Proper Nutrition and Well-Being 8-9-10-11-13e-h-14-17-19	Proper Nutrition and Well-Being 5-6- 9 (a-b-d)-10-18	Sustainability 1- 8-9-10-15
Sustainability 12-13 a-d 18	Sustainability 7-12-21-22	Hygiene 4-
Hygiene 16	Hygiene 8-9 (c) - 23	Training and Education 5-11-12-13
Effects of Good Food 15	Victualling 11-17	Challenges 7-14
General Impression 20	Training and Education 13-14-15-16	-----
-----	Challenges 19 - 20	-----

In the following parts, the responses to each survey will be analyzed according to the main topics they were intended to measure, starting from the one for “Students and Seafarers”.

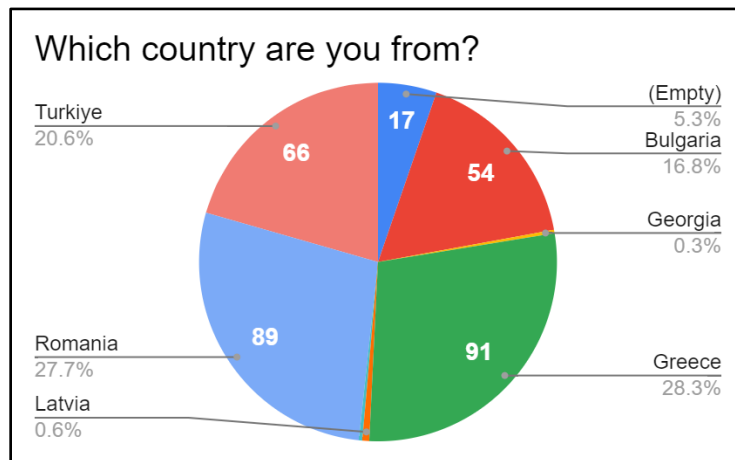
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- [1] <https://www.rmg.co.uk/stories/topics/life-sea-age-sail#:~:text=>
- [2] <https://maritimegoods.com/en/content-details/nutrition-scheme-for-sailors-in-the-old-times.html?ContentID=209>
- [3] <https://www.suustunde.com/tr/content-details/eskiden-denizcilerde-beslenme-duzeni.html?ContentID=209>
- [4] (<https://www.unoks.com/tr/blog/gecmisten-gunumuze-gemi-mutfaklari>)
- [5] https://normlex.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:91:0:::P91_SECTION:MLCA_AMEND_A3

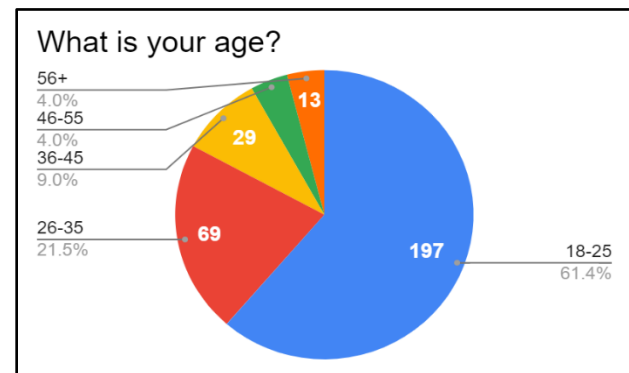
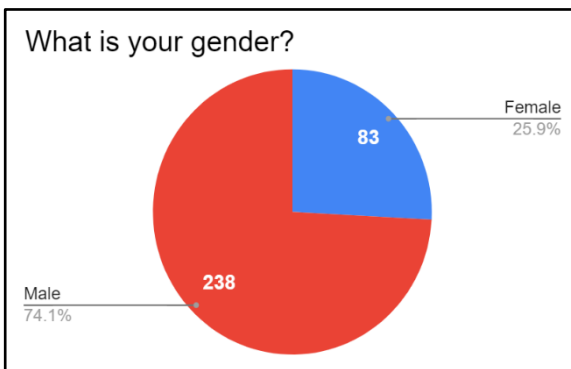
ANALYSIS OF THE SURVEY FOR STUDENTS AND SEAFARERS

DEMOGRAPHIC QUESTIONS

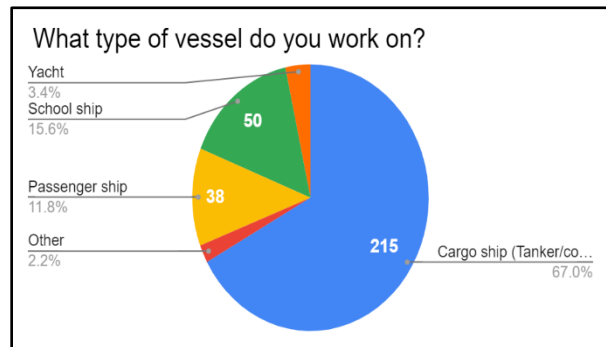
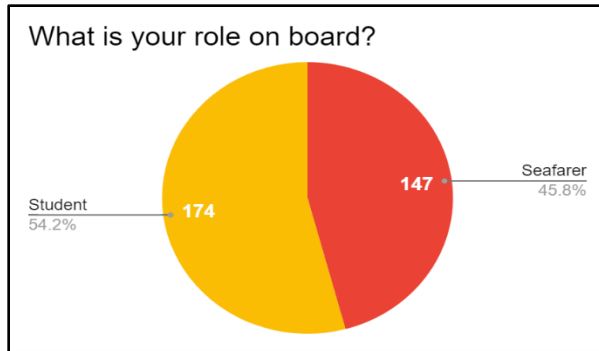
321 participants replied to the survey that was prepared for students and seafarers. 174 of them were students while 147 were seafarers.



As the figures show, most participants are from the partner countries 14 of the participants didn't write which country they come from. 2 participants are from Latvia and 1 participant is from Georgia. 83 of the participants, that is a quarter of them, are female while 238 male participants took the survey.



187 of the 321 participants, which makes 61,4% of them, were between the ages of 18-25. 69 participants, 21,5% of them, were between the ages of 26-35. The number of participants under 35 is 255, Which makes %82,9 of them. Therefore, it can be said that the survey mostly reflects the opinion of the crew under the age of 35.



The number of students who responded to the survey is a few more than the seafarers, that is, 174 students and 147 seafarers participated in the survey. Most of the participants worked onboard cargo ships followed by school ships, passenger ships, and yachts. 2,2% of the participants didn't indicate what kind of ship they worked on.

PROPER NUTRITION AND WELL-BEING

The International Seafarers' Welfare and Assistance Network (ISWAN) has launched the "HEALTHY FOOD" program as one of the topics in the seafarers' health information program sponsored by the ITF's seafarers' trust [1]. The following recommendations for the ideal nutrition of seafarers and excerpts about food on board a ship were taken from their studies:

- Although it remains difficult to estimate the impact of poor nutrition on occupational accidents, the connection between fatigue and nutritional deficiency (iron and vitamin B) is well known. Iron deficiency accounts for a loss in productivity and results in fatigue and loss of dexterity.
- Lack of food can induce drowsiness and is a risk onboard ship. Hypoglycemia (low blood sugar) can shorten attention spans and slow down the processing of information.
- Snacking on sugary foods and drinks gives a short surge in energy but can leave the body more tired afterward.
- Shift work means that meals cannot be taken at "normal" regular times. Shift work can interfere with the standard eating routine. Poor habits can lead to broken sleep, tiredness, and digestive problems. Light meals are the best solution: soups, salads, and lean meat. At the beginning of the shift, eat protein-rich food like yogurt, milk, and lean meat. Later on, in the shift eat carbohydrates like bread, potato salad, pasta salad, fruit, and whole grains.
- Try and eat less spicy food, fried and fatty food, and sweets. Try and cut back on caffeine intake, try fruit juice for a change. Eat light snacks like fruit, yogurt, or a glass of milk. Eat a meal that provides enough energy before the shift starts.

- Smoking is bad for your health. Try and cut down and consider others when someone lights up. Never smoke when others are eating.
- Take regular exercise, if possible, for at least 30 minutes per day.
- If you are working in the afternoon or evening shifts: eat a warm meal at noon instead of in the middle of the shift.
- If you are working at night, try and eat “breakfast” in the late afternoon or early evening. After work eat a light snack to avoid going to bed feeling hungry.
- When the body is metabolizing normally, free radicals are formed which harm the body’s functions. Smoking stimulates the production of free radicals. High levels of free radicals can damage the body’s cells, and cause heart and vascular diseases and cancer. There is evidence to suggest that they also speed up the aging process and can lead to cataracts and other eye diseases.
- Antioxidants neutralize the harmful actions of free radicals, and as such, have a positive effect on health.
- In addition to vitamins, there are other bioactive products such as flavonoids and minerals, for example, selenium, which act as antioxidants.
- The number of antioxidants we need daily to prevent disease is not yet clear to medical professionals.
- Research is still underway on the use and safety of antioxidant preparations.
- Therefore, healthy food habits are considered sufficient.
- To improve concentration and dexterity throughout the morning, do not skip breakfast.
- People who skip breakfast tend to eat more snacks and often overcompensate for the loss of energy by eating a large lunch, rich in fats and sugar.
- Carbohydrates found a lot in bread, grain products, rice, and pasta are an excellent source of energy.
- Milk and milk products are good sources of protein for breakfast.
- It is recommended that you eat several pieces of fruit per day. It is a good idea to start the day with fruit or fruit juice and also stewed fruit or compote, as it is not always possible to get the full quota of nutrients from fresh fruit.
- Omega 3 is an essential fat that plays a crucial part in the development of the brain and nervous system. It prevents cardiovascular disease and supports the immune system.
- A person working at an intensive pace or in a very hot environment such as the engine room loses water and salt through sweat. This loss should be made up by consuming more water and salt.
- Fluid intake should equal fluid loss; what goes out must come in. On average, about 1,5 liter of water each day may be required to replace the fluid loss.

- Plenty of cool (10-15°C) drinking water should be readily available and workers should be encouraged to drink water every 15-20 minutes even if they don't feel thirsty. Sports drinks that are specially designed to replace the minerals they lose can also help.
- A worker who is used to or acclimatized to lifting heavy loads may sweat more and, therefore may need more water or salt that should be proportional to what s/he loses.
- If they want to be healthy, comfortable, and hydrated in a hot environment they should limit or avoid caffeinated drinks such as coffee and some sodas.
- Soft drinks and energy drinks deliver relatively high levels of energy (extra sugar) but do not have nutrient value (vitamins and minerals). They are simply empty sources of calories.
- Moreover, the use of soft drinks is bad for the teeth and may enhance intestinal problems. Light or dietary drinks contain less sugar but are high in artificial sweeteners which do not contain that many calories. The use of these drinks should be limited to a maximum of 2 or 3 glasses a day.
- Water is the best source of liquid [2].

The first question in this group tries to find **“how often they consume certain food groups” so that it can be decided whether they have a balanced diet to sustain a healthy life onboard.**

In the questionnaire, the participants were first asked questions about their general health status. The questions were designed to find out whether the seafarers were experiencing problems that could be caused by malnutrition or that could be prevented by good nutrition. Of course, malnutrition is not the only cause of problems, but it is worth considering the possibility that it may trigger or exacerbate them. The working conditions of the seafarers require them to have a certain diet. How their diet should be and what kind of food they need more because of working onboard have been the subject of several studies. In addition, the Seafarers' Health Information Program prepared a guide for healthy food onboard [3].

The International Seafarers' Welfare and Assistance Network of seafarers has launched HEALTHY FOOD as one of the topics in the seafarers' health information program sponsored by the ITF's seafarers' trust. The following lines are taken from this source.

Basis of Healthy Food

Meals have to supply enough proteins for the formation and repair of body tissues, an adequate supply of minerals to reinforce body tissues, sufficient carbohydrates, and the right amount of fats for energy. There must also be vitamins and antioxidants to keep the body's functions in good order. Crucially good quality drinking water needs to be drunk in large quantities, at least 1,5 liters per day.

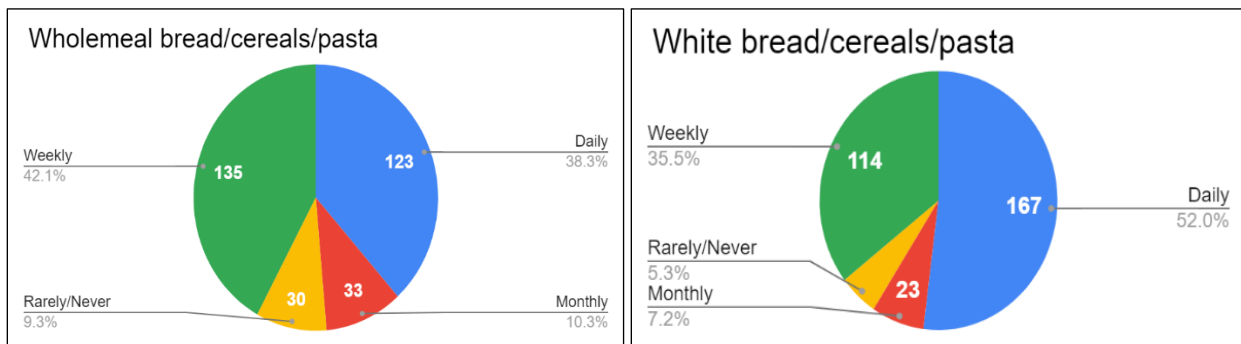
Five Tips for Healthy Food Habits:

1. *Balance is the key message*
2. *Eat plenty of fruit (3 servings) and vegetables (300 g), potatoes and whole grain products*
3. *Reduce the amount of meat (+/- 100 g), fat (< 35%), sugar and salt you eat*
4. *Drink plenty of water and milk products*
5. *Eat breakfast*

A good tool for ensuring a balanced diet is a food pyramid. As food habits vary a lot throughout the world, it is difficult to give a universal practical guide to healthy eating and the preservation of good health, but the essential elements are explained below.

Rice, whole grain products, and potatoes at the base of the pyramid are rice, noodles, bread, pasta, cereals, potatoes, porridge, lontong, chapati, naan, idli, thosai, and biscuits. These foods are excellent sources of complex carbohydrates, vitamins, minerals, and dietary fiber. It is recommended that 5 servings a day be consumed, preferably including 1 serving of wholegrain products. An average person eats 175-420 grams of bread (5- 12 slices), 210-350 g of potatoes (3-5 pieces), or 180-300 g of rice per day. When working in shifts this group is better taken towards the end of the shift, instead of at the beginning.

As the explanation makes clear, both eating breakfast and consuming foods high in nutrients are indispensable prerequisites for a healthy life onboard. In the survey prepared for seafarers and students, the answers of the participants for these options are shown below.



Bread and whole grain products contain B1, B2, B6, B11 E, and K1 vitamins, which are essential for energy production, mainly by carbohydrate metabolism.

The main functions of these vitamins are:

Supporting the correct functioning of the nervous system by producing energy (B1) and mobilizing iron. They are essential in the metabolism of carbohydrates, proteins, and fat. They are also important for healthy skin (B2).

They also help to reduce magnesium shortages, control hormone activities, produce red blood cells (B6, B11), and are important for the growth and preservation of body cells (B11).

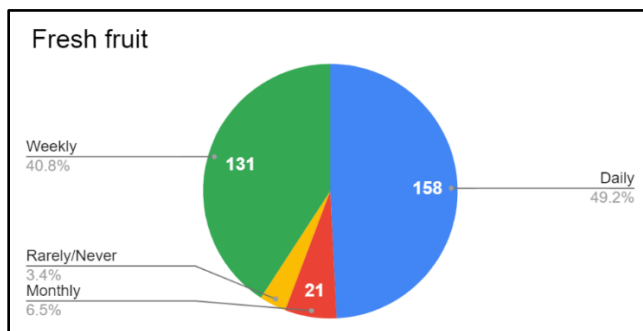
Vitamin E in this group has a role in many enzymatic reactions and the protection of cells and cell membranes while vitamin K is necessary for blood coagulation.

The findings of this item show that the students and seafarers are quite good at their bread/cereal/pasta preferences and the frequency with which they eat them is generally reasonable.

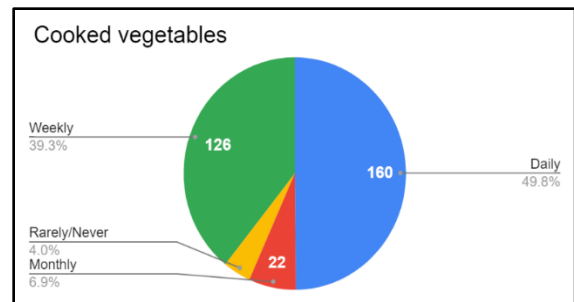
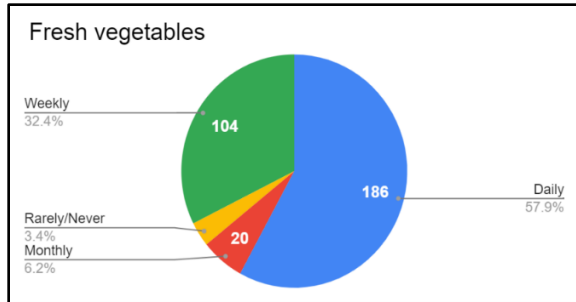
Despite this, more in-depth information on the subject is needed.

The study conducted by International Seafarers' Welfare and Assistance Network (ISWAN) says that an average person eats 175-420 g of bread (5- 12 slices), 210-350 g of potatoes (3-5 pieces), or 180-300 g of rice per day. When working in shifts this group is better taken towards the end of the shift, instead of at the beginning.

The fruit group consists preferably of fresh fruit but also dried, frozen, canned fruit, and fruit juices. They are rich sources of vitamins A, and C, potassium, fiber (excluding fruit juices), and flavonoids. **Seafarers should eat 2 to 3 servings a day, especially the deeply or brightly (yellow, orange) colored ones. It is seen that almost half of the seafarers and students are not aware of this requirement which means they are likely to suffer from the lack of vitamins A- B2-B5-B11 C-E-K11.**



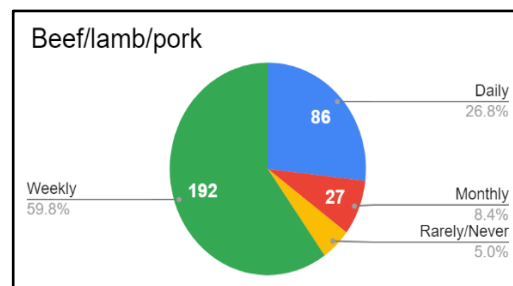
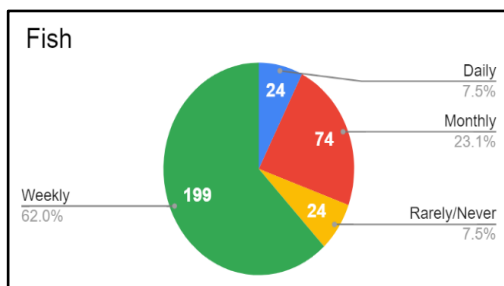
The vegetable group consists of leafy, non-leafy, cruciferous, and root vegetables. They are rich sources of vitamins A, and C, folic acid, minerals such as calcium, iron, potassium, fiber, and Phyto-chemicals. People onboard should eat 2 servings a day and include 1 serving daily of dark green or yellow-orange vegetables.



They are important for seafarers since they are rich sources of the vitamins A, B1, B2, B5, B11, C, E, and K1, which are generally responsible for eyes functioning correctly, the formation of skin cells, hair and gums, healthy immune system and correct functioning of the nervous system. They are also important in producing red blood cells, histidine, glycine, methionine, protein synthesis, DNA and RNA synthesis, bone formation, and growth and preservation of body cells.

Although two servings a day is recommended for seafarers, it was found that 32% of them eat vegetables once a week 6% eat once a month and 3.4 % never eat vegetables. The situation is worse when it comes to cooked vegetables since 51% of the seafarers eat vegetables either once a week, or less frequently.

Meat, fish, and alternatives groups include meat, poultry, fish, and seafood. Alternatives are soya, pulses, nuts, and seeds. These foods are excellent sources of protein, iron, and zinc. 100 g per day is sufficient.



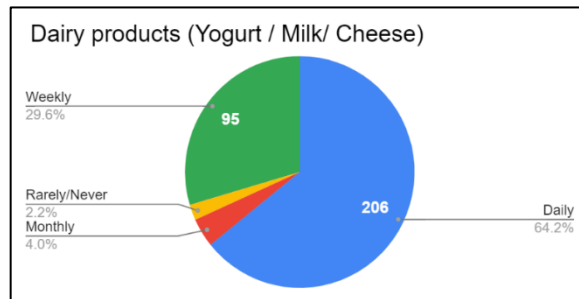
Fish, contains B2, B6, B12 vitamins while red meat is rich in A, B1, B2, B5, B6, B12, K1 vitamins.

Fish is a good source of protein, vitamins, and minerals. Aim to eat at least two portions of fish a week, including at least one portion of oily fish, which are high in omega-3 fats and help prevent heart disease. Oily fish include salmon, trout, herring, sardines, and mackerel. (ITF Seafarers) [4]

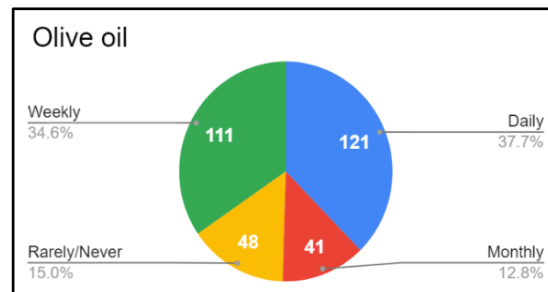
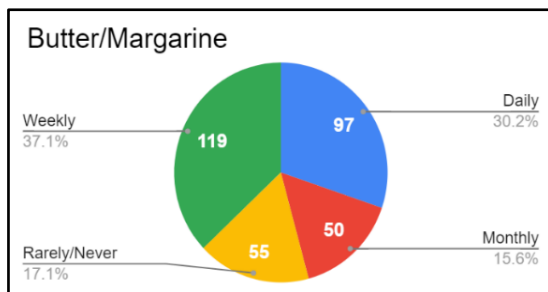
Survey results show that 62% of seafarers eat fish weekly, which is the recommended amount, on the other hand, the percentage of those who eat fish less is not to be underestimated, which signals that seafarers need to know what and how often they need to eat to be healthy.

Dairy Products are excellent sources of protein, and calcium, and have A, B1, B2, B5, B6, B8, B11, B12, K1 vitamins. Seafarers should drink 2 to 3 glasses of skimmed or half-fat milk or yogurt per day and should try to eat 2 servings of cheese. They should bear in mind the fat quantity in these foods and try to consume low-fat products where possible.

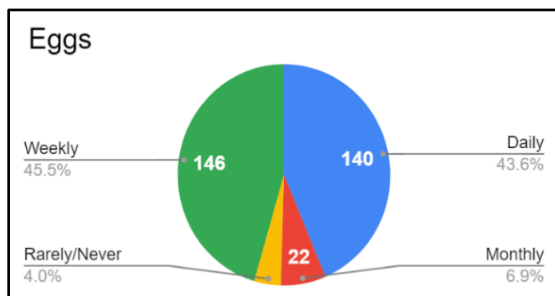
In our survey, the majority (64.2%) eat dairy products daily. 29.6% eat them weekly while 4% eat them monthly. It is interesting to learn that 2.2% never eat them, which may be because of being allergic to some kinds of food or something like that.



Although fat and oil give energy and contain essential vitamins A, D, E, and K, too much of it can lead to increased weight and increased cholesterol levels. Therefore, it is important to keep an eye on the amount of fat seafarers consume so that they can be healthier and more productive. This group contains also chips, mayonnaise, fatty sauces, cream, etc., and should be taken in limited quantities.



Healthline states that for most healthy adults, it's safe to eat 1–2 eggs a day depending on how much other cholesterol is in the diet. If a person already has high cholesterol or other risk factors for heart disease, it may be best to eat no more than 4–5 eggs per week [5].

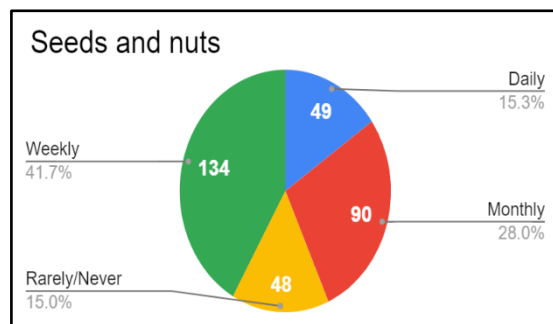


Eggs, which contain vitamins A, B8, B12, B5, B6, and K1, are daily consumed by less than half of the seafarers. It is not enough if they do not have any reason that prevents them from eating eggs like high cholesterol. It is advised that 1-2 eggs should be eaten daily for a healthy diet. The number of seafarers and

students eating eggs weekly is more than those eating them daily. %10 of the 333 participants eat them neither weekly nor daily, which may be due to health problems since people with high cholesterol are not advised to eat eggs. As a result, it is revealed that seafarers and students do not eat eggs as much as needed. They should be encouraged to eat eggs more and be taught the nutritional values of eggs.

Nuts and Peanuts

Nuts and seeds are good sources of protein, healthy fats, fibers, vitamins, and minerals. Nuts and seeds regulate body weight as their fats are not fully absorbed and they regulate food intake. They contain unsaturated fats and other nutrients that provide protective effects against heart disease and diabetes. Research by Mayo Clinic found that eating nuts frequently lowers levels of inflammation related to heart disease and diabetes. Regularly eating a healthy diet that includes nuts may also improve artery health, reduce inflammation related to heart disease, and reduce cholesterol [6].

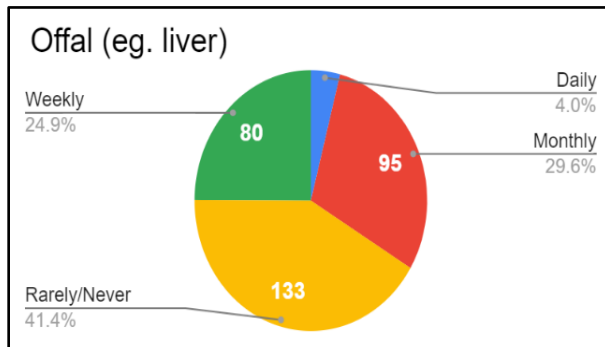


Research indicates that what type of nut or seed is chosen whether it's almonds, walnuts, peanuts, pumpkin seeds, or sunflower seeds, all varieties appear to be similarly positively associated with health outcomes [7]. Nuts and seeds have both a high nutrient density and high energy density. This means that although they contain a higher

number of calories per gram, they also have an overall high nutritional value. They are high in protein, fiber, and monounsaturated and polyunsaturated fats (including omega-3 and omega-6 fatty acids). For example, a small handful of mixed nuts (25 g) contains, on average, 4.5 g of protein, 1.7 g of fiber, and 165 calories. They are also rich in vitamins and minerals and a range of phytochemicals, such as polyphenolic compounds (e.g., phenolic acids, flavonoids), phytosterols, and carotenoids. Vitamins and minerals abundant in nuts and seeds include, for example, biotin, pantothenic acid, vitamin B6, thiamine, vitamin E, calcium, iron, magnesium, manganese, molybdenum, and selenium.4,5.

The survey found that only 15 % of the seafarers have a daily intake of seeds and nuts, which contain B8 and E vitamins. This finding is in parallel with the finding of the research [8] which revealed that the intake of seafarers' polyunsaturated fat, particularly fatty acids of omega-3 origin (e.g., fish, nuts, rapeseed oil) was low. So, seafarers should opt for a variety of nuts and seeds that are affordable and available to them to reap their many benefits.

A healthy alternative to snacks such as nuts, or yogurt should be available, and the crew should be encouraged to go for one of these options as opposed to a less healthy snack. The crew should not eat snacks rich in fats and sugar [9].



Organ meats are first-class nutrient suppliers and a natural supplement. Accordingly, offal is packed with nutrients, especially B and A, D, E vitamins, copper, zinc, iron, magnesium, folic acid, and selenium. Animal protein provides all nine essential amino acids that your body needs to function effectively. When it comes to organ meats, beef liver is the reigning champion. Although beef

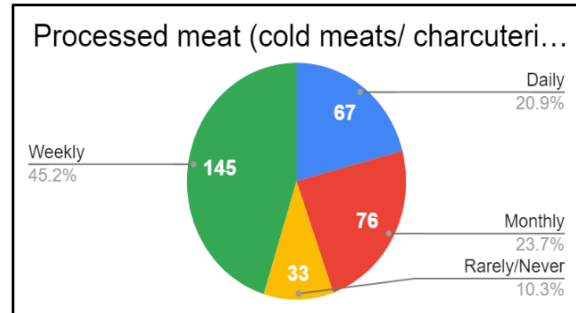
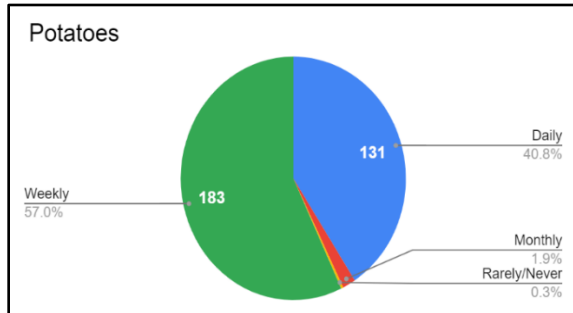
liver does not taste good if not appropriately prepared, there is hardly a more nutritious food. Above all, the liver can provide precisely those nutrients that are difficult to find elsewhere [10]:

They are particularly rich in B vitamins, such as vitamin B12 and folate. They are also rich in minerals, including iron, magnesium, selenium, and zinc, and important fat-soluble vitamins like vitamins A, D, E, and K. Melrose Health’s nutritional Guide says that including organ meats 1-2 times per week can strike the right balance between reaping the benefits and avoiding the consumption of excess nutrients, such as vitamin A. <https://melrosehealth.com.au/>

The survey results show that seafarers do not prefer eating offal: however, they should be encouraged to eat them often, especially liver, which is called the multivitamin of nature, to be healthier to withstand the harsh conditions on board.

Many people are surprised to learn just how nutritious legumes are. Legumes provide fiber, protein, carbohydrates, B vitamins, iron, copper, magnesium, manganese, zinc, and phosphorous. Legumes are naturally low in fat, are practically free of saturated fat, and because they are plant foods, they are cholesterol-free as well. Beans and legumes contain antioxidants that help prevent cell damage and fight disease and aging. The fiber and other nutrients benefit the digestive system and may even help prevent digestive cancers. Legumes can be added to any meal, for breakfast, lunch, or dinner. Studies conducted by Harvard Health definitively linked a diet high in legumes with a lower risk of developing obesity, diabetes, high blood pressure, high cholesterol, heart disease, or strokes. Eating legumes every day can effectively treat these diseases in people who already have them since they are amazingly nutritious, high in protein and fiber, low in fat, and low in glycemic load [11, 12, 13].

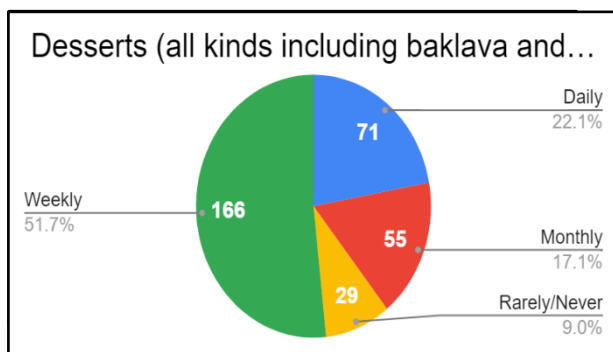
The survey revealed that only 27.7 % of the participants eat legumes daily while 57.6 % of them consume them weekly. 14.6 of the participants eat legumes monthly, rarely or never. That signals that nearly a quarter of the seaman/students are aware of the benefits of legumes and consume them daily. So those who consume them less learn how beneficial they are and include them in their diet more often.



The International Transport Workers Federation (ITF) says starchy carbohydrates (including potatoes, bread, rice, pasta, and cereals) should make up just over a third of the food you eat.

ITF advises avoiding packaged and processed foods, as they often contain large amounts of sugar, salt, or unhealthy fats. It also advises cutting down on saturated fat, as it can increase cholesterol in the blood and the risk of heart disease. This is found in many foods, including fatty cuts of meat, sausages, butter, cheese, and processed food. When seafarers have meat, they should choose lean cuts and cut off any visible fat.

They should also watch their salt intake. Keeping it to less than 5g per day helps to prevent hypertension and reduces the risk of heart disease and stroke in adults. Even if you do not add salt to your food, you may still be eating too much. Since it is seen that almost 66 % of them consume them daily or weekly basis, it

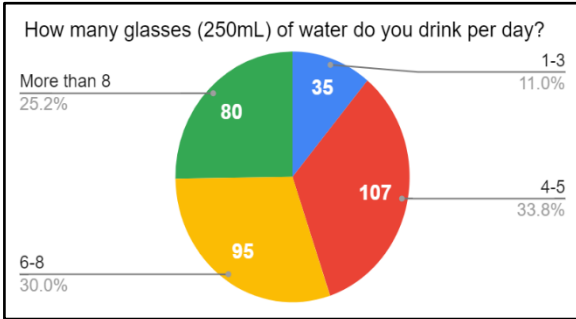


will be advisable to refresh their knowledge on the dangers and potential risks of eating them.

Sugary food and drinks are loaded with calories and provide little by way of nutrition. Such foods are also a major source of tooth decay. Seafarers should cut down on sugar. Regularly consuming foods and drinks high in sugar also increases your risk

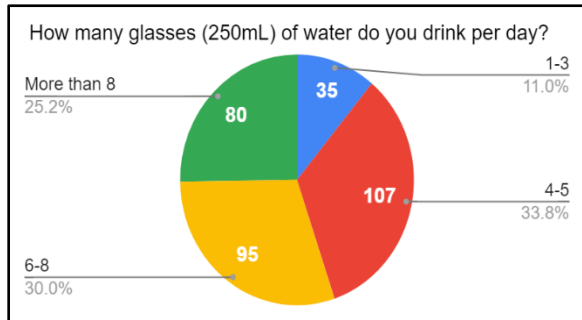
of obesity.

On the other hand, high salt consumption can raise blood pressure which creates a greater risk of developing heart disease **Survey results show that seafarers and students are quite conscious about consuming desserts or the like since it was revealed that daily consumption is 22,1% and weekly consumption is 51,7%.**



Although water does not give us energy and is not part of this food pyramid, it is indispensable for our bodies. In normal circumstances, 1.5 liters should be consumed per day. In warm climates, when undertaking strong physical activity and playing sport it is necessary to drink more fluids. It is best to drink water from unopened bottles if the quality of drinking

water is uncertain. Not everybody can drink all types of mineral water as some contain a high level of minerals. Products containing caffeine, such as tea, coffee, and soft drinks should not be drunk more than 3 times per shift and should be avoided five hours before sleeping. ITF says “Drink plenty of water. Water helps flush our systems of waste products and prevents dehydration, which causes tiredness, low energy, and headaches. Drink six to eight glasses every day. All non-alcoholic drinks count, but water, lower-fat



milk, and low-sugar drinks, tea, and coffee are healthier choices” [14]. **As the figure shows, 30% of the seafarers drink 6-8 glasses of water everyday while 25.2% drink more than this amount. It is concluded that almost half of the seafarers (44,8%) do not drink an adequate amount of water daily, which means they need to know the benefits of drinking**

water sufficiently.

In June 2010 the International Maritime Organization (IMO) adopted amendments to the International Convention on Standards of Training, Certification and Watchkeeping, 1978 (STCW). Among the amendments were new requirements in Regulation VIII/1 (Fitness for duty) and its associated Code provisions for all administrations to ensure the establishment of adequate measures to prevent alcohol and drug abuse. Section A-VIII/1 of the Code prescribed a limit of 0.05% blood alcohol content for masters, officers, and other seafarers while performing designated safety, security, and marine environmental duties. Section B-VIII/1 recommended that each company consider the implementation of a written policy of drug and alcohol abuse prevention, including the prohibition of consuming alcohol within four hours before serving as a member of a watch. The Act was modified in 2015 by the Shipping (Alcohol) (Prescribed Limits Amendment) Regulations 2015, to bring UK law into line with the STCW 2010 Manila Amendments [15].

These rules are obeyed all over the world. Following are the rules set by the National Maritime Occupational Health and Safety Committee (NMOHSC) in parallel with IMO amendments.

- Moderate consumption of alcoholic drinks is a feature of social relaxation and interaction in many environments. However, on board a ship any level of alcohol consumption by crew members has implications for the safety of the ship and other persons.
- Any seafarer who is under the influence of alcohol whilst on board is potentially a danger to their ship and people on board. Even small quantities of alcoholic drinks are sufficient to impair judgment and increase the risk of accidents.
- In addition, a seafarer with an alcohol-related problem is unlikely to be capable of working safely at any time.
- Inappropriate consumption of alcohol can affect work performance and lead to problems of discipline and supervision. It can be the cause of unsafe acts endangering the ship, the seafarer and others on board, the cargo, and the marine environment. It can cause ill-health and in extreme cases death and can ultimately be extremely costly both to the employer and to seafarers and their families.
- Coping with alcohol misuse requires active employer interest and involvement. Managing the issue requires careful consideration of questions of safety, health, welfare, sickness, absence management, and discipline.
- For these reasons it is considered important that shipping companies adopt policies on alcohol as part of their health and safety policies. A company policy that follows the guidelines set out in this document will enjoy the support of the trade unions Nautilus International and RMT.
- In this guidance, “alcohol-related problem” means either alcohol dependency or habitual drinking to an extent that may be detrimental to the health and the safety of the ship, the seafarer and others on board, the cargo, and the marine environment. It should be viewed as a potentially treatable illness.

However, alcohol can be permitted onboard on condition that some rules should be obeyed. NMOHSC puts some rules to determine the maximum blood/alcohol levels permitted by the company for seafarers on board by stating that the company should carry out a risk assessment, taking into account the nature of the trade(s) in which it is involved, the design of the ship, the characteristics of its cargoes, the schedules of duties of crew members and the operations in which they are involved, to inform the determination of the permissible blood/alcohol levels on board.

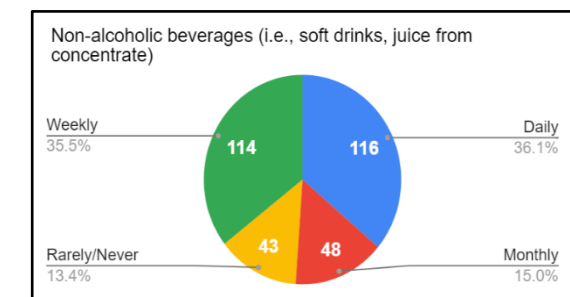
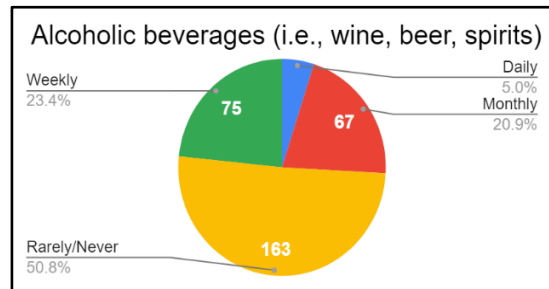
The company should then take into consideration the following factors: -

- the extent to which the ship is a home to its crew as well as a workplace.
- the length of tours of duty on board.

- the need to maintain the trust and confidence of the traveling public.
- the company’s ability to enforce its chosen level.
- relevant national and local legislation in ports of call.

The company should then decide on its maximum permitted level and make clear that exceeding this level will be treated by the company as gross misconduct.

In the survey, it is observed that seafarers/students are aware of the rules related to alcohol consumption as well as its hazards since it was learned that 50.8% of the participants said they rarely/never consume alcoholic beverages. It is seen that 20.9 % drink alcoholic beverages monthly while nearly a quarter of the participants consume them weekly. The percentage of daily consumers is 5. They should obey some rules such as not consuming alcoholic



drinks at least 4 hours before any scheduled watch-keeping or work period or 24 hours before entering or operating in the territorial waters of the United States, Canada, and the European Union [16].

These rules are subject to change depending on the country or territory.

Most participants expressed that they consume non-alcoholic beverages daily (36.1% of the participants) or weekly (35.5 % of the participants). There are several types of non-alcoholic drinks, some healthier than others. Concentrates made from 100% fruit are the healthiest option, as they pack the most nutrients and are only sweetened with natural fruit sugars — not added sugar. Products sold as concentrated fruit cocktails, punch, or beverages are made from a blend of juices. These often include added flavors or sweeteners to compensate for a lack of whole fruit juice concentrate may offer nutrients that reduce inflammation and promote healthy skin. It’s also more affordable than packaged juices and doesn’t spoil as easily. However, j juice concentrates are lacking in fiber and are sometimes loaded with added sugar and preservatives or flavorings. If possible, eat whole fruits and veggies instead. The best thing to do is to read labels carefully to make sure that they are not harmful to health, pick 100% fruit concentrate for the healthiest choice and, if possible, eat whole fruits and veggies instead [17].

Appeasing Hunger in a Healthy Way

If people experience hunger crises, that is, sudden hunger, the underlying cause of these complaints may be fluctuations in their blood sugar as a result of malnutrition. In people with low blood glucose levels, signals are sent to certain parts of the brain and the person feels the desire to eat. Sweets or excess food intake to stop this desire can lead to uncontrolled weight gain, diabetes, and various cardiovascular diseases. Therefore, it is very important to prevent hunger attacks [18].

Here are a few ways to cope with a hunger crisis: Embrace fruit, not sweets instead of desserts that are high in processed sugar, you can turn to fruits that are rich in vitamins and minerals and high in fiber. Of course, it is also important to control portions of fruit. It is enough to consume 1-3 servings of fruit during the day. 1 medium-sized apple, 4 apricots, 1 peach, 1 orange, or 15 grapes corresponds to one serving of fruit.

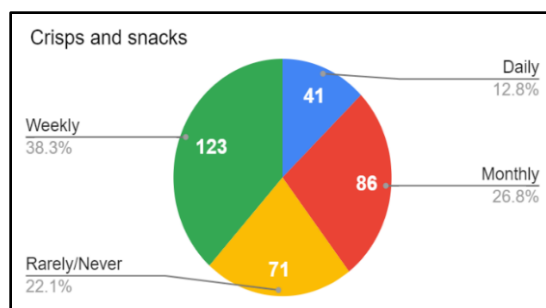
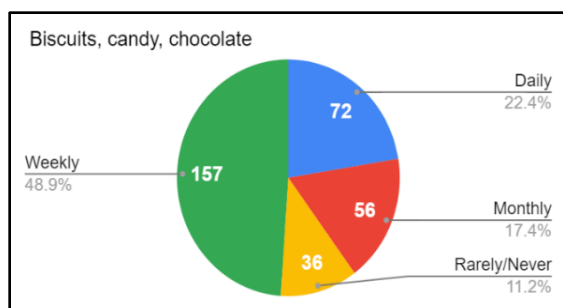
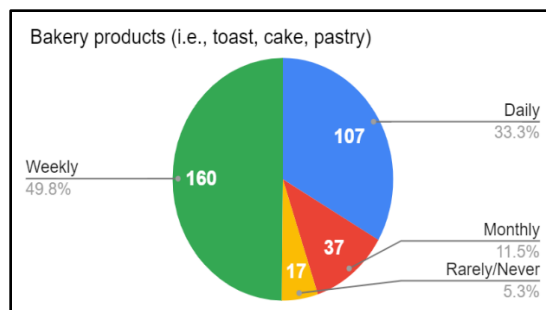
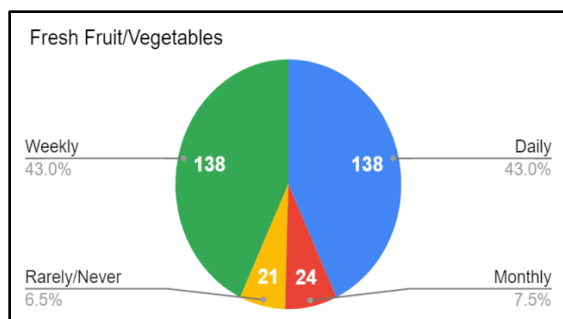
From this perspective, it is seen that seafarers are conscious since 86% of them eat fruit in case of hunger.

On average 2-3 hours after your main meals, you may start to feel hungry and crave a snack. This is the signal given by your blood sugar. In this case, walnuts, hazelnuts, or almonds, which are rich in minerals such as magnesium, phosphorus, and zinc, as well as their vegetable oil content, stay in the stomach for a long time and give a feeling of satiety, the right option. However, to reduce calorie intake and not increase fat content, prefer raw ones and be careful not to consume more than 1 handful. Bakery products, biscuits, candy, chocolate, crisps, and snacks are among the commonly consumed foods and drinks to prevent sudden hunger that are recommended limiting [19].

Seafarers often resort to these foods, especially bakery products, every week. This result shows that, instead of those that have negative effects, they should be introduced to healthier alternatives and added to their diets.

“How often do you eat the following food groups when you feel hungry?”

	Daily n- %	Weekly n- %	Monthly n-%	Rarely/ Never n-%
a. Fresh fruit/ vegetables	138-%43	138 %43	24 %7.5	21 % 6.5
b. Bakery products (i.e., toast, cake, pastry)	107 %33.3	160 &49.8	37 % 11.5	17 % 5.3
c. Biscuits, candy, chocolate	72 % 22.4	157 % 48.9	56 % 17.4	36 %11.2
d. Crisps and snacks	41 % 12.8	160 % 49.8	37 % 11.5	17 % 5.3



Survey results reveal that fresh fruit consumption for healthy nutrition or to appease hunger, whatever the reason is, is quite common among the crew on board. Although the number one preference is when they are hungry, they also eat bakery products, candy, chocolate, or snack groups, which are not very healthy. It can be assumed that most of them are conscious of choosing the healthy option to eat when hungry, but they still need to know the harmful effects of the other choices on their health.

“Please specify how much you agree with the following statements.”

	Strongly Disagree n-%	Disagree n-%	Neither Disagree nor Agree n-%	Agree n-%	Strongly Agree n-%
a. I eat plenty of fresh fruit and green leafy vegetables	15 % 4.7	29 % 9	89 % 27.2	119 % 37.1	15 % 4.7
b. I follow a balanced diet	16 % 5	50 % 15.6	107 % 33.3	126 % 39.3	22 % 6.9
c. I know what to eat to maintain my health on board	12 % 3.7	21 % 6.5	61 % 19	167 % 52	60 % 18.7
d. I eat a lot of bread because I can't get enough food during the meal service	69 % 21.5	120 % 37.4	65 % 20.2	53 % 16.5	14 % 4.4
e. I try to do simple workouts when on board to keep in good health	20 % 6.2	44 % 13.7	63 % 19.6	141 % 43.9	53 % 16.5
f. When planning the menu, I believe the goal is to achieve a balanced diet while ensuring satiety	10 % 3.1	19 % 5.9	77 % 24	149 % 46.4	66 % 20.6
g. Being aware of having a nice meal at the end of the day increases my work motivation	---	10 % 3.1	39 % 12.1	120 % 37.4	152 % 47.4
h. I am satisfied with the current provision of healthy and nutritious food onboard.	15 % 4.7	44 % 13.7	101 % 31.5	122 % 38	44 % 13.7

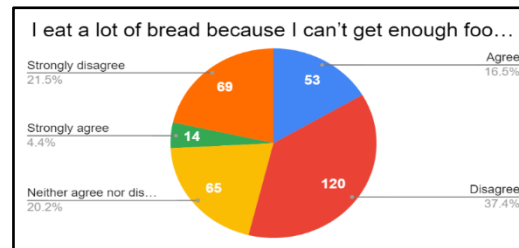
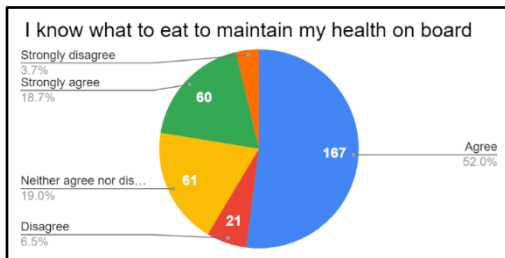
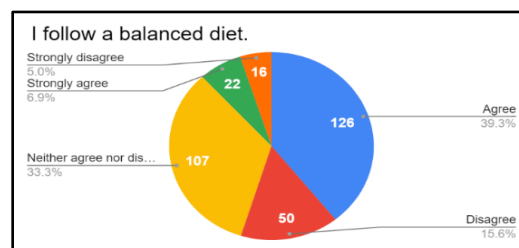
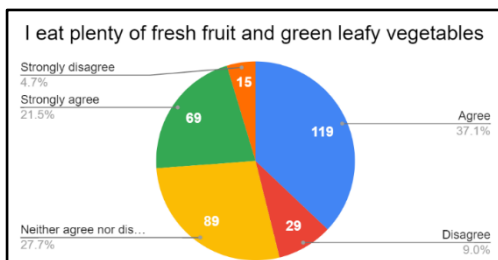
It is seen that 41.8 % of the participants are conscious about eating what is better for their health and 46.2% of them say they follow a balanced diet. These figures are less than half of the participants, which brings out the idea that they need what a balanced diet on board requires and what they should eat to maintain their health onboard.

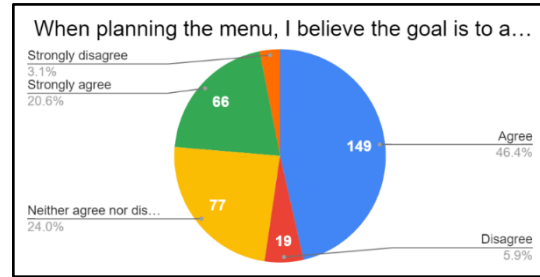
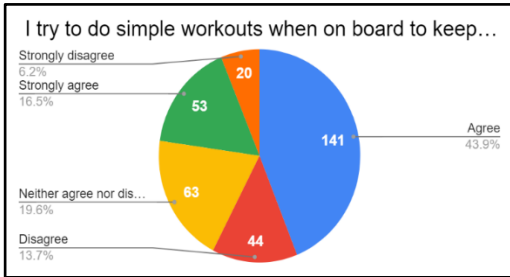
When the third question is considered, it is seen that there is a contradictory situation here. Because 70.7 of the participants responded that they knew what to eat to maintain their health on board. This may suggest that they know something wrong or incomplete. Some other questions in the questionnaire revealed that their knowledge of healthy nutrition was not sufficient.

84.4% of the respondents stressed the importance of good food regarding motivation and good mood onboard, while 51.7% of them said they were satisfied with the current provision of healthy and nutritious food onboard. That means almost half of them are not happy with the current food provision or have not had an idea concerning the food onboard.

These results reveal not only the need to make ship personnel more aware of the requirements of healthy nutrition, but also the need to plan, prepare, or serve meals more satisfyingly.

The figures below belong to this section of the survey.





SUSTAINABILITY

Sustainability means different things to different people; various precautions can be taken to make the kitchen, which is the galley in this study, more sustainable. Some of them that are taken from the “Sustainable Kitchens” website are given below:

1. Use Eco-friendly Cleaning Products

Many of the everyday items in the kitchen are made with plastic and other non-biodegradable materials which end up in landfills and are ultimately adding to the rising plastic catastrophe we are all facing.

Everyday cleaning products are usually bought in plastic bottles, used, and then replaced. These can be easily swapped for eco-friendly alternatives such as recycled or glass bottles which can be reused and refilled with a large refill (if there is storage) or many companies are making refill pouches made from recyclable materials.

Great examples of quick changes to start eco changes in the kitchen are cleaning bottles, kitchen sponges and brushes, and even gloves made from 100% plant-based or biodegradable materials.

2. Ditch The Plastic

Plastic has become an everyday material and is used to package thousands of products, especially in the kitchen. It can be overwhelming to know where to start with removing plastic from our life. To start, consider simple swaps to reduce plastic usage.

People started to use reusable shopping bags. Every time they refuse the plastic bag, it does add up and makes a difference.

The next simple change is to switch to biodegradable bin bags. Not only can we start to use biodegradable bags in our food caddies, using biodegradable trash bags as our bin liners will degrade into smaller particles

over time and tackle the jumbo roll of bin liners under the sink. Don't be fooled into thinking the bags will break and they are weak, they are stronger than people think!

The next swap is clingfilm, beeswax wrappers are a reusable and sustainable alternative to single-use plastic wrap. Used to preserve food, beeswax wrappers are breathable, helping food to last longer, plus, they tend to come in funky designs to add some jazz to the fridge.

Understandably, parties can be a little bit less stressful by using throwaway cutlery and plates to save any washing up. Bamboo cutlery and paper plates can replace single-use plastics, just don't forget to recycle the replacements.

3. Using long-lasting, high-quality cookware

Factors often overlooked are the materials and chemicals used to coat and create cookware, plus the lifespan we expect from our purchases.

4. Energy-efficient appliances

Use energy-efficient appliances. Investing in good, energy-efficient appliances will be an investment piece, designed to keep bills down in the long term.

Use a water-efficient dishwasher. Think about swapping that gas hob to induction for a more energy-efficient outcome. The fridge, investing in a good quality fridge not only helps with bills but keeps food fresher for longer.

5. Energy-efficient cooking

Try more efficient and sustainable ways when cooking.

Ovens powered by electric energy instead of fossil fuels keep mealtimes more sustainable. If you love your food as much as we do, cooking less might not be an option, but experimenting with raw foods and salads reduces oven time, and even one-pot meals use less energy, washing up, and water.

Easier fixes can be found by reducing oven time, with newer model ovens and air fryers there's little need to preheat for a long period and can even be turned off 5-10 minutes before you have finished cooking, and the residual heat will do the rest.

Covering pots and pans to ensure water is boiled quicker will also reduce hob time and boiling the kettle with only the water needed helps.

Another tip that's good for the environment, our health (recipe dependent), and our wallets is batch cooking. Cooking a lot at once and storing leftovers for lunch and other meals can save cooking time and prevent us from buying daily meal deals, reducing packaging and saving money!

6. Buy local ingredients

Choosing locally sourced ingredients not only supports local communities, farmers, and growers but shopping locally also reduces the air miles and preservatives needed to get items to you and keep them in an OK state.

Try the local weekend markets with organic products, free from chemical pesticides, fertilizers, and plastic! A sustainable change to big supermarkets.

Fruit and vegetable delivery boxes are readily available in most communities, and usually, the produce is much more delicious.

7. Invest in quality kitchen cabinetry

Kitchen remodeling can be a huge strain on the environment. Opting for a timeless, solid wood kitchen will last you a lifetime [20].

The United States Environmental Protection Agency (EPA) has studies on sustainable food management. It describes sustainable management of food as an approach that seeks to reduce wasted food and its associated impacts over the entire life cycle, starting with the use of natural resources, manufacturing, sales, and consumption, and ending with decisions on recovery or final disposal.

EPA works to promote innovation and highlight the value and efficient management of food as a resource. Through the sustainable management of food, people can conserve resources for future generations, reduce greenhouse gas emissions that contribute to climate change, help businesses and consumers save money, and provide access to food for those who do not have enough to eat. To build a circular economy for all, EPA seeks to highlight opportunities to use raw materials more efficiently, enable those resources to be used for their highest value, and recover valuable resources from discarded materials in ways that address climate change, are inclusive of all communities, address environmental justice concerns, and help spur innovation and economic growth.

What is Wasted Food and Where Does it Come From?

The term “**wasted food**” describes food that was not used for its intended purpose and is managed in a variety of ways described below. EPA uses the overarching term “wasted food” instead of “food waste” for

food that was not used for its intended purpose because it conveys that a valuable resource is being wasted, whereas “food waste” implies that the food no longer has value and needs to be managed as waste.

Wasted food is an overarching term to describe food that was not used for its intended purpose and is managed in a variety of ways, such as donation to feed people, creation of animal feed, composting, anaerobic digestion, or disposal in landfills or combustion facilities. Examples include unsold food from retail stores; plate waste, uneaten prepared food, kitchen trimmings from restaurants, cafeterias, and households; or by-products from food and beverage processing facilities. The term wasted food can be used to refer to both excess food and food waste.

Excess food (or surplus food) often refers to food that is donated to feed people.

Food waste often refers to food not ultimately consumed by humans that is discarded or recycled, such as plate waste (i.e., food that has been served but not eaten), spoiled food, or peels and rinds considered inedible. For purposes of Sustainable Development Goal Target 12.3, food waste occurs at the retail, food service, and residential levels and is managed by landfill; controlled combustion; sewer; litter, discards and refuse; co/anaerobic digestion; compost/aerobic digestion; and land application.

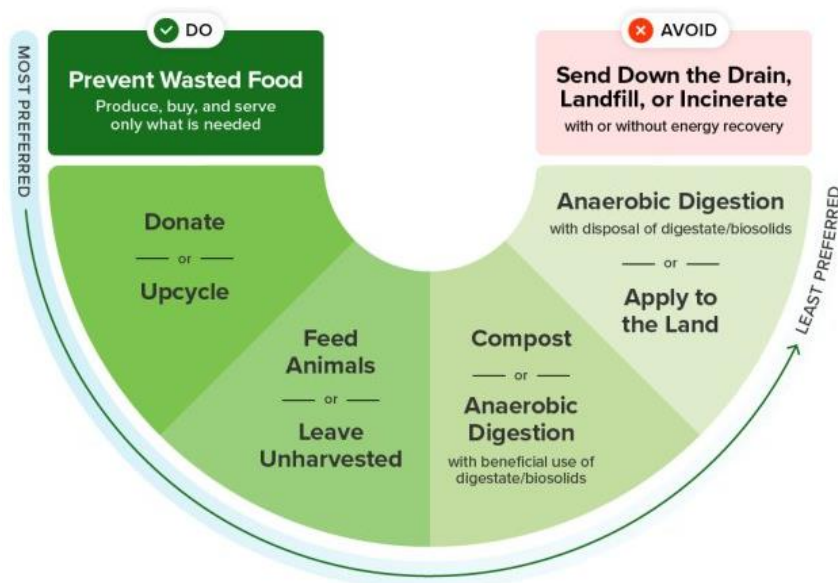
Food loss often refers to unused products from the agricultural sector, such as unharvested crops. For purposes of Sustainable Development Goal Target 12.3, food loss occurs from production up to (and not including) the retail level.

EPA encourages anyone managing wasted food to reference the Wasted Food Scale, which prioritizes actions that can be taken to prevent and divert wasted food from disposal. The most preferred pathways – prevent wasted food, donate and upcycle food – offer the most benefits to the environment, to communities, and to a circular economy.



Wasted Food Scale

How to reduce the environmental impacts of wasted food



Wasted Food Scale [21]

Why is Sustainable Management of Food Important?

Wasted food is both a growing problem and an untapped opportunity. In 2019 alone, EPA estimates that about 66 million tons of wasted food were generated in the food retail, food service, and residential sectors, and most of this waste (about 60%) was sent to landfills. EPA estimated that in 2018 in the U.S., more food reached landfills and combustion facilities than any other single material in our everyday trash (24 percent of the amount landfilled and 22 percent of the amount combusted with energy recovery). Additionally, the U.S. Department of Agriculture estimates that in 2010, 31 percent or 133 billion pounds of the 430 billion pounds of food available at the retail and consumer levels was not eaten, valued at almost \$162 billion.¹ Globally, the United Nations estimates that approximately one-third of all food produced for human consumption is lost or wasted – 13 percent of food is lost before reaching retail, and 19 percent is wasted from retail to consumer. At the same time, food loss and waste generate 8-10 percent of global greenhouse gas emissions.

When food is wasted, so is the opportunity to nourish people. When food is wasted, so are all the resources that go into producing, processing, distributing, and preparing that food.

Taking simple steps in your everyday life can make a difference in addressing this issue. Reducing wasted food is a triple win; it's good for the environment, for communities, and for the economy.

Conserving Resources and Reducing Greenhouse Gas Emissions

Reducing wasted food does great things for the environment:

Saves Resources – When food is wasted, it also wastes the resources – such as the land, water, energy, and labor – that go into growing, storing, processing, distributing, and preparing that food. Each year, food loss and waste take up an area of agricultural land the size of California and New York combined. This is enough energy to power 50 million U.S. homes for a year and generate emissions (excluding landfill emissions) equal to the annual carbon dioxide emissions of 42 coal-fired power plants.

Reduces Greenhouse Gas Emissions – The majority of greenhouse gas emissions from wasted food result from activities before disposal, including production, transport, processing, and distribution. Once food goes uneaten, it must be managed through one of various pathways, such as donation, upcycling, composting, anaerobic digestion, or landfilling – all of which also produce greenhouse gas emissions. To reduce these emissions, we need to prevent food from being wasted in the first place and sustainably manage what wasted food cannot be prevented.

Reduces Methane from Landfills – When wasted food goes to a landfill, the nutrients in the food never return to the soil. The wasted food rots and produces methane, a greenhouse gas 28 times as powerful as CO₂ at trapping heat in the atmosphere. EPA estimates that wasted food is responsible for 58% of landfill methane emissions to the atmosphere.

Returns Nutrients to the Soil – Even when we take all actions to use wasted food, certain inedible parts remain and can be turned into compost to feed and nourish the soil. Composting these wastes creates a product that can be used to help improve soils, grow the next generation of crops, and improve water quality.

Supports a Circular Economy – Preventing food from being wasted, using food for its highest value, which is to nourish humans, and recovering valuable nutrients from wasted food are all activities that support a circular economy by reducing stress on natural resources, empowering communities, growing local economies, and spurring innovation.

In 2021, the EPA released the first of two reports in a series on the environmental impacts of wasted food to inform domestic policymakers, researchers, and the public about the environmental benefits that can be achieved by reducing U.S. food loss and waste. The Part 1 report, *From Farm to Kitchen: The Environmental Impacts of U.S. Food Waste*, examines the environmental impacts of wasted food from production to consumption. EPA released Part 2, *From Field to Bin: The Environmental Impacts of U.S. Food Waste Management Pathways*, in 2023, which completes the analysis by examining the different ways wasted food is managed. The results of this research are the basis for EPA's Wasted Food Scale.

Preventing and sustainably managing wasted food and recovering wholesome, nutritious food can help you make a difference in your community in the following ways:

Feed Children – The U.S. Department of Agriculture estimates that five million children lived in food-insecure households in 2021. By redirecting food that would otherwise be wasted to homes and schools, we can help feed our country's children.

Build Cleaner Communities – Reducing waste and improving waste management can help create cleaner communities. Equitable access to food and processing wasted food into soil amendments can improve soil health, generate renewable energy, and keep the economic and job benefits of organics recycling in those communities.

Create Job Opportunities – Recovering and recycling wasted food through donation, salvaging, processing, anaerobic digestion, and composting strengthens infrastructure and creates jobs. Food recycling in these sectors employs more than 36,000 people, supporting local economies and promoting innovation.

Feed the World – According to the Food and Agriculture Organization of the United Nations, between 702 and 828 million people were affected by hunger in 2021. They predict that by eliminating food loss and wasted food we would have enough food to feed all the chronically undernourished. They also expect that we would not have to increase food production or put additional pressure on our natural resources to do so.

When we waste food, we're not just creating a problem, we're also missing an opportunity to save businesses and consumers money in the following ways:

Waste Less and Spend Less – You or your organization can spend less and waste less by buying only the food you will use. Preventing wasted food can also reduce energy and labor costs associated with throwing away good food.

Pay Less for Trash Pickup – Organizations might pay less for trash pickup by keeping wasted food out of the garbage. Some haulers lower fees if wasted food is separated from the trash and sent to an organic recycling facility instead of the landfill.

Receive Tax Benefits by Donating – If you donate healthy, safe, and edible food to hungry people, your organization can claim tax benefits.

All ships have galleys the size of which depends on the size of the ship. Among the ships, the cruises have the biggest galleys.

A massive cruise ship galley puts out thousands of plates each day. Chefs require supersized stations that can produce larger quantities of foods and sauces, like 60-80 liters of gravy or glaze. A ship that carries

3,500 passengers uses 600 pounds of butter per day, 250,000 eggs per week, and 170,000 pounds of fresh fruits and vegetables per cruise.

Naturally, there are more hands-on decks in the kitchen too. While a standard restaurant or moderately sized ship may have 120 staff members on the roster, a large cruise ship galley requires a bigger brigade. Large vessels might count up to 200 team members [22].

Today's cruise ships are laden with restaurants and cafes. No matter the time of day or night, there's a whole smorgasbord of food tempting you. And even though there might be 2,000 passengers on board, there's no way every single morsel can be eaten.

So, there are some questions like "What happens with all the leftover food once the cruise is over?", "Does it feed the crew or the fish?", "Is it served to passengers in the buffet the next day?"

The following remarks can be made about some negative rumors/myths on the subject:

Myth 1: The crew eats the leftovers.

This is one of those myths that seems to be carried from ship to ship, and it's simply not true. The crew mess will serve a different (and much cheaper) selection of food in the passenger dining rooms. The only scenario in which they will be served the same food as passengers is if it didn't leave the galley – in other words, they won't receive anything passengers have left behind. Any crew member caught nibbling on passenger food without permission can be fired.

Myth 2: Leftover food is donated to charity

While this might be a noble thing to do in theory, there are strict health regulations that prevent cruise ships from donating any leftovers to a shelter, or even reusing them. It's the same story with restaurants on land too. However, some cruise lines will donate non-food items like soap, shampoo, televisions, and cutlery.

Myth 3: Leftover food is served up again the next day

We're pleased to tell you this myth is not true. Cruise lines have standards to uphold, and much of this comes from the high quality of food they serve at each mealtime.

However, the truth can be given in the following lines:

Once the food has been cooked, no matter whether it hasn't been touched, it must be disposed of. The easiest way for ships to do this is to liquefy the leftover food in an industrial grinder. The food is blended with water until it's a smooth mixture and then either disposed of in port, incinerated, or pumped out to sea when the ship is in deep water and away from the coastlines.

The biggest waste comes from those passengers who order large meals or pick one of everything from the buffet and don't finish their plate.

But not as much food will go to waste as you think. Cruise ships are highly experienced at working out how much food is required according to the length of the cruise and the number of passengers. It is highly calculated and in no way random. After all, every piece of waste food is money down the drain.

Food ingredients that haven't been cooked or prepared and have a longer shelf-life may stay on board for the next cruise. This might include things like flour, salt, and so on.

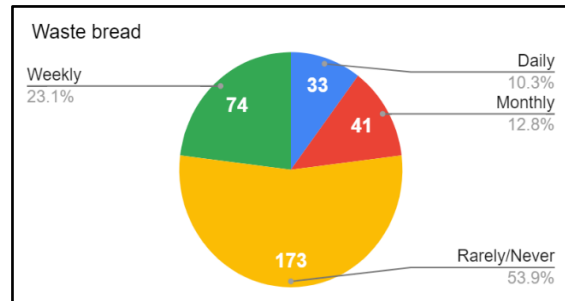
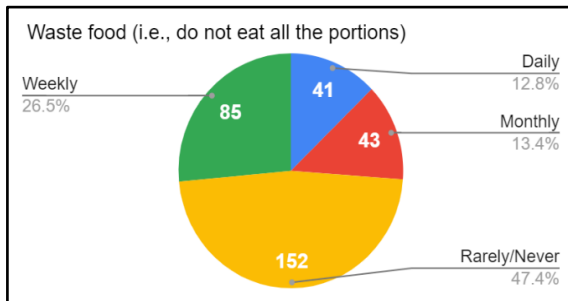
As a final note – do not take food from the ship when you leave. Many ports, especially in Australia, are extremely strict on what you can and cannot bring into the country [23].

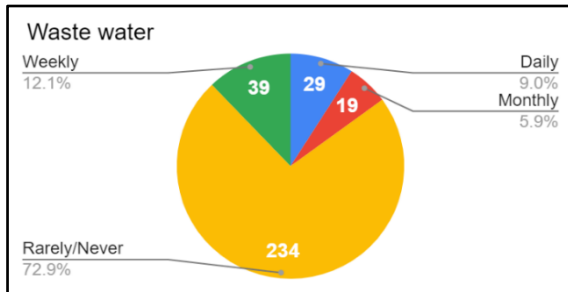
Although the information given so far belongs to the passengers of the ships, there are leftovers created by the crew of the ship. The next set of questions is about the frequency of the leftover production by the crew.

“Please specify how often you... “

	Daily n - (%)	Weekly n - (%)	Monthly n - (%)	Rarely/Never n - (%)
a. Waste food (i.e., do not eat all the portions)	41 %12.8	85 %26.5	13.4 %43	152 %47.4
b. Waste bread	33 %10.3	74 %23.1	41 %12.8	173 %53.9
c. Wastewater	29 % 9	39 %12.1	19 % 5.9	234 %72.4

In light of these explanations about sustainability, it is expected that seafarers and maritime students are likely to adopt some courses of action to ensure sustainability in the galley. One of these actions will be to avoid waste of food, bread, and water.





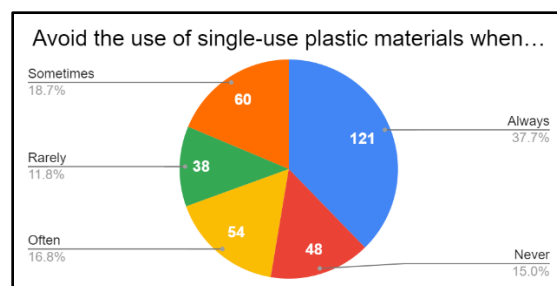
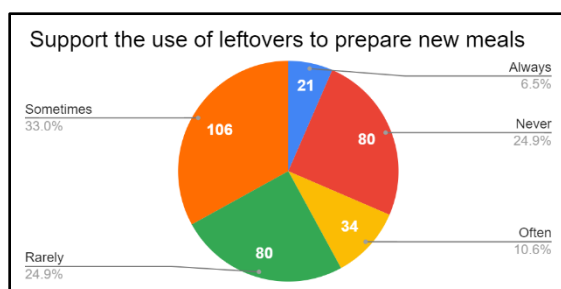
Most participants in the survey are quite conscious of the sustainability issues concerning food, bread, and water. However, there are still some of them who need to be aware of the importance of sustainability and get some training to be more sustainability conscious. In light of these

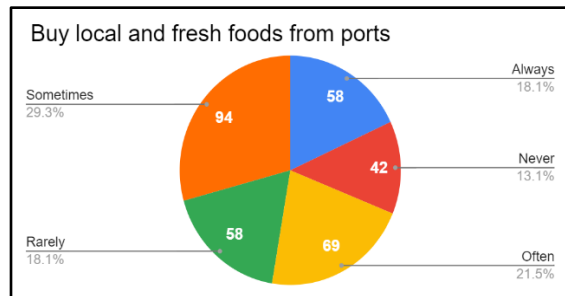
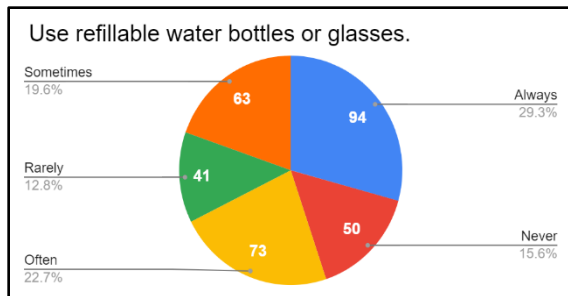
explanations about sustainability, it is expected that seafarers and maritime students are likely to adopt some courses of action to ensure sustainability in the galley. One of these actions will be to avoid waste of food, bread, and water.

It is emphasized by many studies that the galley is one of the main areas where sustainability, which finds a place in every field and every stage of life, should be implemented. A lot of research has been conducted on what sustainability practices can be included in the galley and how they can be implemented, and the subject has been supported by many institutions and organizations. This part of the study tries to determine the perspective and attitude of the ship personnel towards the measures that can be taken in the galley regarding sustainability and what is the contribution of the personnel to sustainability in the existing situation. Another set of questions related to sustainability is given in the following part:

“Please specify how often you ...”

	Never (%)	Rarely (%)	Sometimes (%)	Often (%)	Always (%)
a. Support the use of leftovers to prepare new meals	80 % 24.9	80 % 24.9	106 % 33	34 % 10.6	21 % 6.5
b. Avoid the use of single-use plastic materials when dining	48 % 15	38 % 11.8	60 % 18.7	54 % 16.8	121 % 37.7
c. Use refillable water bottles or glasses	94 % 29.3	41 % 12.8	63 % 19.6	73 % 22.7	94 % 29.3
d. Buy local and fresh foods from ports	42 % 13.1	58 % 18.1	94 % 29.3	69 % 21.5	58 % 18.1





Using leftovers to prepare new meals, avoiding the use of single-use plastic materials, using refillable bottles or glasses, and buying local foods are some of the tips for environmentally friendly meal preparation [24,25,26,27,28].

With so much emphasis on sustainability and so much work being done to promote sustainability in the galley, it is surprising that the crew is still not fully supportive of taking measures to promote sustainability in the galley. Of the four statements in this part of the survey, only two are supported, although not fully but half, by the participants. They are “Avoiding the use of single-use plastic materials when dining” supported by 54.5 % of the participants and “Using refillable water bottles or glasses”, supported by 52 % of the participants. The other two statements were hardly supported by the participants. That is 17 % of the participants said they often or always supported the use of leftovers to prepare new meals, and 39,6 % of them said they bought local and fresh foods from the markets.

This shows that there is a need for training to make the participants, consisting of seafarers and students, more aware of sustainability.

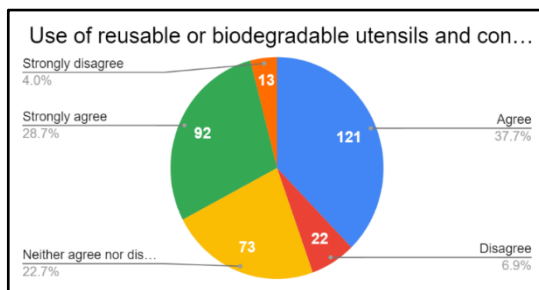
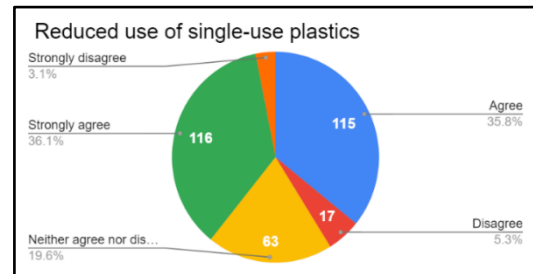
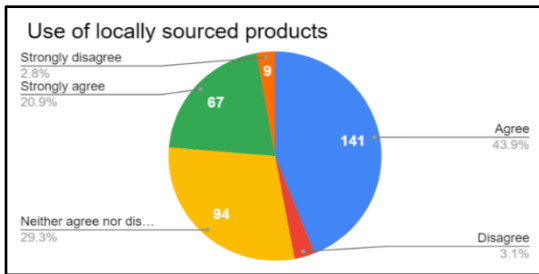
“Please specify how often you....”

	Never (%)	Rarely (%)	Sometimes (%)	Often (%)	Always (%)
Eat healthy when you want to	18 -% 5.6	17- % 5.3	102-% 31.8	91- % 28.3	93- % 29
Stock up on nuts (i.e., hazelnuts, walnuts, raisins) and dark chocolate before on board	66- % 20.6	56- %17.4	88 - % 27.4	60- % 18.7	51- % 15.9
Eat junk food when under pressure/ stress	72- % 22.4	84- %26.2	111-% 36.4	38- % 11.8	16 - % 5
I am picky about food.	46- %11.3	78 - % 24.3	110 - %34.3	49- %15.3	31- %11.8

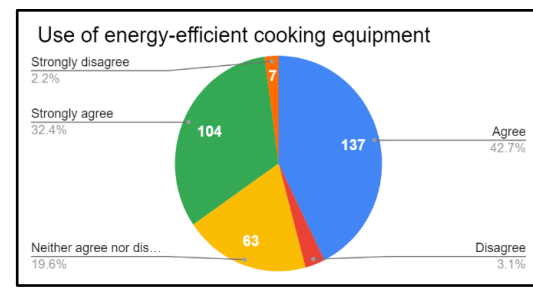
A study conducted by the Cleveland Clinic found that many people use food as a coping mechanism to deal with such feelings as stress, boredom, or anxiety, or even to prolong feelings of joy,” says Dr. Albers. “While

this may help in the short term, eating to soothe and ease your feelings often leads to regret and guilt, and can even increase negative feelings [29].

“Which of the following environmental practices could be implemented in the galley operations onboard ships?”



To



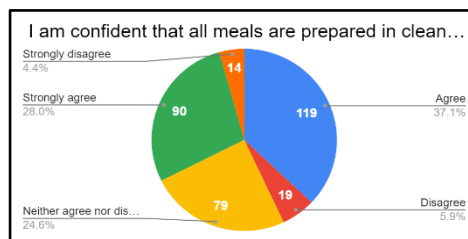
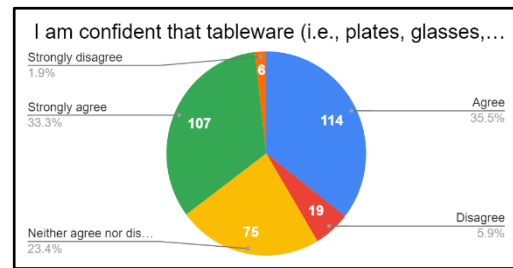
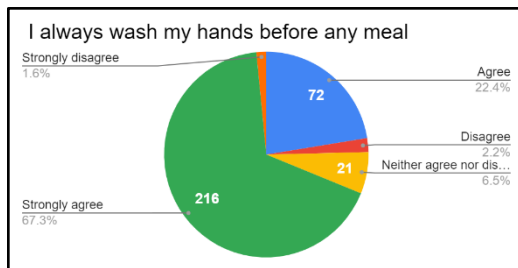
ensure sustainability, which is one of the most important issues of contemporary times, all individuals need to have a mindset that supports sustainability. Being conscious of this issue is possible not only by participating in practices but also by realizing practices that ensure sustainability in every field. Participants are expected to be aware of and support sustainability practices that can be implemented in the galley, even if they do not work in the galley. Survey results show that participants support all the measures to provide sustainability, use of energy-efficient cooking equipment, and reduced use of single-use plastics being the most supported ones. They were supported by 75.1% and 71.9% of the participants respectively. The next two measures to be determined by the seafarers are the use of reusable or biodegradable utensils or materials, which were supported by 66,4% of the participants, and the use of locally sourced products which were seen as the right course of action by the respondents. There are many other ways to support sustainability onboard ships. Only four of them are given here. **When all the correct and effective behaviors in this regard are taken into account, it becomes clear that seafarers are not very active and willing to support sustainability in the galley. Therefore, it should be explained to them that sustainability is an issue that should be emphasized in the galley as well as in all units of the ship what measures should be taken to ensure sustainability in the galley, and what benefits can be obtained by taking these measures and they should be made more aware of this issue.**

HYGIENE

“Please specify how much you agree with the following statements regarding good hygiene practices.”

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I always wash my hands before any meal.	5	7	21	72	216
I am confident that tableware (i.e., plates, glasses, and cutlery) is properly clean.	6	19	75	114	107
I am confident that all meals are prepared in clean and healthy conditions.	14	19	79	119	90

The importance of hygiene in all areas, especially in terms of health, is undeniable in the field of food. This becomes even more important when people have to live together for a long time in a small and limited environment such as a ship. The necessity to ensure hygienic conditions and to comply with hygiene rules, which has gained sensitivity, especially after the pandemic period, has also manifested itself in the answers given to the questions on this subject.



Although there are a lot of “strongly agree” and “agree” responses to these questions, the existence of neutral and negative responses is quite noteworthy. 33% of the respondents were found to be less meticulous about washing their hands before meals. There may be different reasons for this, but in any case, this most basic hygiene issue is too important to neglect. Another striking finding of this group of questions is that the respondents do not think the conditions in the galley are hygienic enough for them since %31.2 of them are not confident that tableware (i.e. plates, glasses, and cutlery) is properly clean. Another sign to that respondents have some hygiene concerns; 34.9% of them are

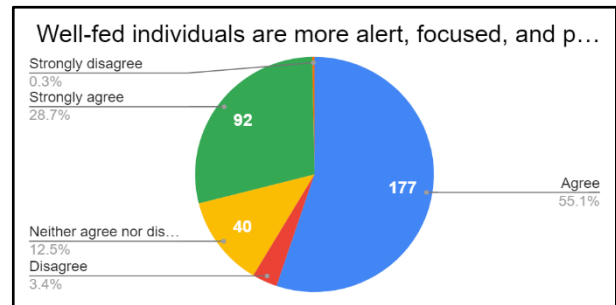
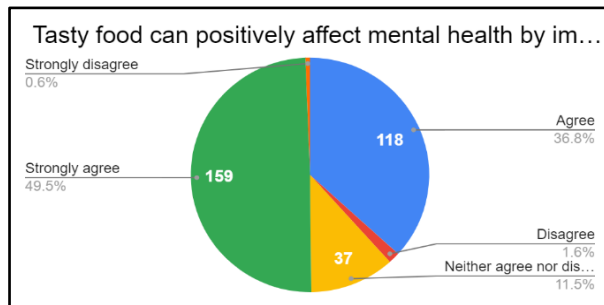
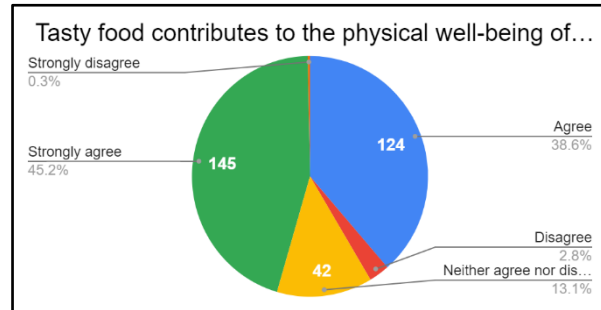
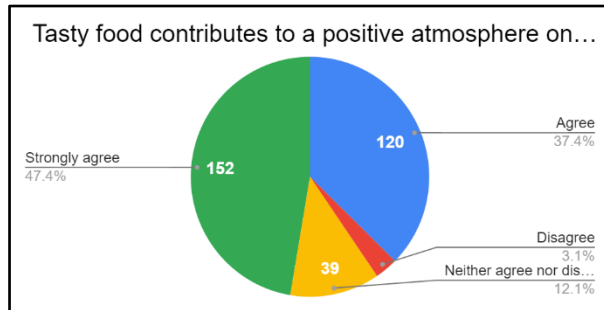
not sure or do not have an opinion on whether the meals are prepared in clean and healthy conditions. These mean something should be done to change the perceptions of the seafarers/students.

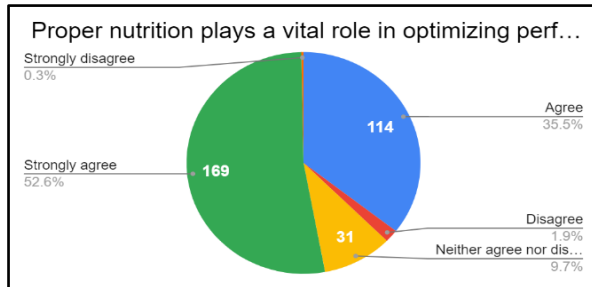
HOW DOES GOOD FOOD AFFECT THE CREW?

Please specify how much you agree with the following statements regarding “Tasty and special food”.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Tasty food contributes to a positive atmosphere on board by creating a feeling of comfort, enjoyment, and camaraderie	0	10-%3,1	39-%12,1	120-%37,4	152-%47,4
Tasty food contributes to the physical well-being of individuals on board	1-%0,3	9-%2,8	42-%13,1	124-%38,6	145-%44,2
Tasty food can positively affect mental health by improving mood, cognitive function, and general well-being	2-%0,6	5-%1,6	37-%11,5	118-%36,8	159-%49,5
Well-fed individuals are more alert, focused, and productive, which is essential for the efficient and safe performance of tasks on board	1-%0,3	11-%3,4	40-%12,5	177-%55,1	92-%28,7
Proper nutrition plays a vital role in optimizing performance and productivity.	1-%0,3	6-%1,9	31-%9,7	114-%35,5	169-%52,6

Figures regarding the questions are given below.





Employers also use good food to create a sense of community and a positive work culture. When employees eat together, it's an opportunity for them to bond. This sense of community leads to increased motivation. Additionally, food serves as a reward for a job well done. When an employee or team meets a

particularly challenging goal, a meal is a great way to recognize their hard work [30].

The food on board vessels is one of the main entertainments and a big part of the crew's welfare. A paper broadcast by The International Seafarers' Welfare and Assistance Network (ISWAN) says that food gives physical strength to our bodies. It provides us with the energy to be prepared for a hard-working day. It can make us feel at home when we are far away, but it can also make us sick. Food also provides mental strength. It can control the motivation of a single person or even the entire crew on board, and it can steer their relationship. The ship's galley is not only where the cook whips up the meals, but also moreover the central meeting point on a ship where people and their stories come together, and the cook finally becomes the leading character on board regarding the mental well-being of their colleagues. What happens when we limit the cooks' opportunities and make it impossible for them to serve qualified meals? It simply causes extra mental stress. Mealtimes should be viewed as an enjoyable social experience with good, healthy food options to maintain a healthy lifestyle for our tireless key workers. They also say that A recipe for the people on board should always come from the people on board. It is difficult for us sitting ashore to consider and control the importance of cultural and religious diversity of nutrition on ships with several nationalities and different tastes [31].

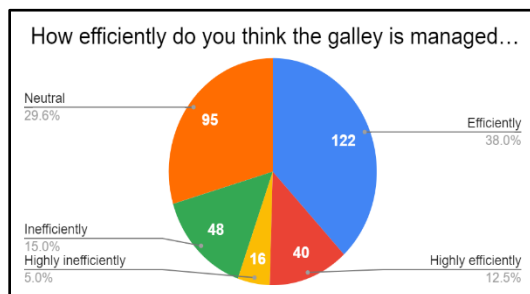
Choosing healthy foods like vegetables and fruits improves mood and mental wellness. [32, 33].

The positive contributions of tasty food to the overall performance, welfare, and satisfaction of seafarers are acknowledged by a great majority of the participants. This puts forward the importance of good food on board. As the figures indicate, a vast majority of the respondents agree or strongly agree with the positive effects of good food onboard, which means they are aware of the benefits of good food like motivation, high morale, and productivity. Nevertheless, the fact that there are around 15 percent negative responses for each question shows that not all respondents agree on this issue and that some respondents, albeit a very small number, do not agree. In this case, it would be appropriate to emphasize that the relationship between good food and motivation, and high morale exists not only in the maritime environment but also in every field and to support this situation with examples.

GENERAL INFORMATION

“How efficiently do you think the galley is managed onboard ships?”

Highly inefficiently (%)	Inefficiently (%)	Neutral (%)	Efficiently (%)	Highly efficiently (%)
16 - %5	48 - %15	95 - %29.6	122 - %38	40 - %12.5



As the figure shows, the percentage of seafarers and students who think positively on the issue is not very high. Only half of the participants (50,5%) think the galley is managed efficiently or highly efficiently while 29,5% of them did not have a negative or positive idea. 20% of the participants think it is managed inefficiently.

The result signals that something should be done for the efficient management of the galleys.

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ANALYSIS OF THE SURVEY FOR GALLEY STAFF

The second survey, prepared and implemented within the scope of the CUL-MAR-Skills Project, was designed to obtain the general opinions of the galley staff on sustainability, hygiene, victualling, education, and training issues. It aims to identify the strengths and weaknesses of the galley staff within the framework of the identified topics and to specify the subjects that need to be developed, improved, and/or taught from scratch.

Galleys, or shipboard kitchens, play a critical role on vessels, particularly in ensuring the health, morale, and operational efficiency of the crew. The main reasons why they are important can be given under the following headings:

1. To ensure good nutrition and strong health of the crew.

- Providing a Balanced Diet: A well-equipped galley allows for the preparation of balanced meals, essential for maintaining the physical health of the crew during long voyages.

- Ensuring Food Safety: Proper storage and preparation of food reduce the risk of foodborne illnesses, which can be detrimental in the isolated environment of a ship.

2. To keep the crew's morale up

- Ensuring Comfort and Well-being: Good meals can significantly boost morale, especially during long periods at sea or in challenging conditions. The galley is central to providing comfort food that can help alleviate the stresses of life onboard.

- Providing Cultural Familiarity: On ships with international crews, the galley often serves meals that cater to diverse cultural preferences, contributing to a more harmonious onboard environment.

3. To ensure operational efficiency

- Sustained Energy: Providing the crew with nutritious and satisfying meals ensures they have the energy to perform their duties effectively, which is crucial for the safety and smooth operation of the ship.

- Scheduling: The galley helps maintain routine and order by offering meals at regular intervals, which is essential for crew discipline and time management during voyages.

4. To guarantee safety and convenience in special circumstances

- Emergency Provisions: The galley is responsible for preparing and storing emergency rations, which are critical in case of extended periods at sea or in survival situations.

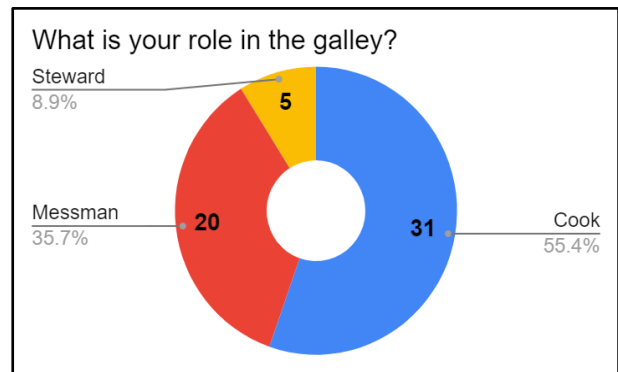
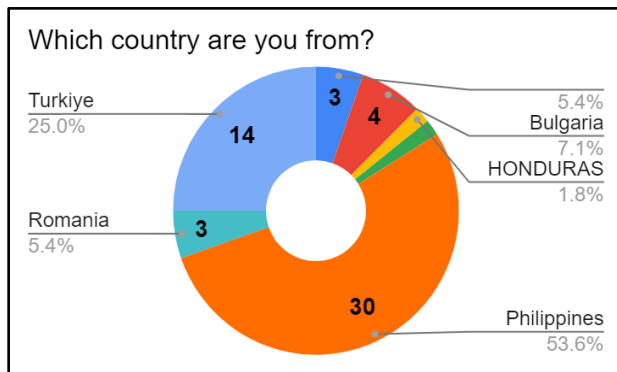
- Heat and Hygiene Management: Properly designed galleys help manage heat and maintain hygiene, reducing the risk of fires or contamination, both of which can have severe consequences onboard.

5. Achieving long-term sustainability

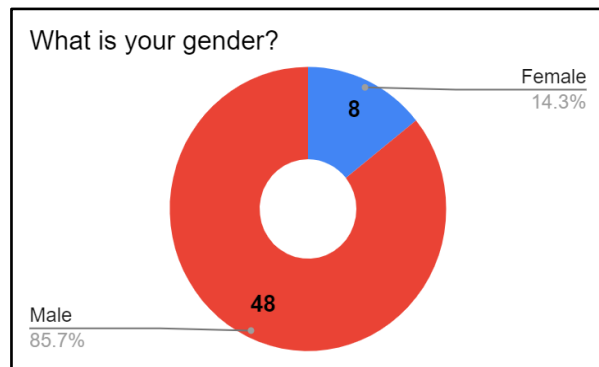
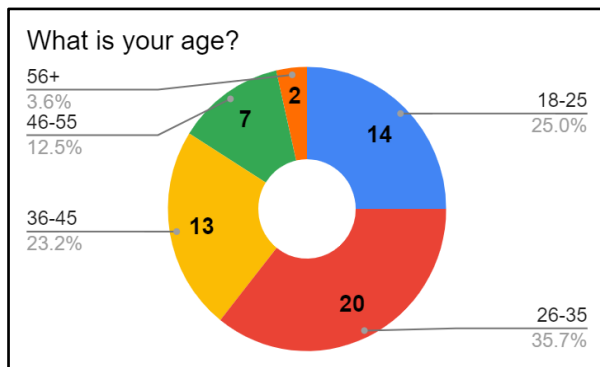
- Efficient Resource Use: Modern galleys are often equipped with technologies that minimize waste, conserve energy, and manage water use, contributing to the overall sustainability of the ship's operations. As a result, the galley is far more than just a place to prepare food; it's a vital component that impacts the overall functionality, safety, and well-being of a ship and its crew. The efficiency of the galley directly influences the ship's ability to operate smoothly over long periods at sea.

DEMOGRAPHIC QUESTIONS

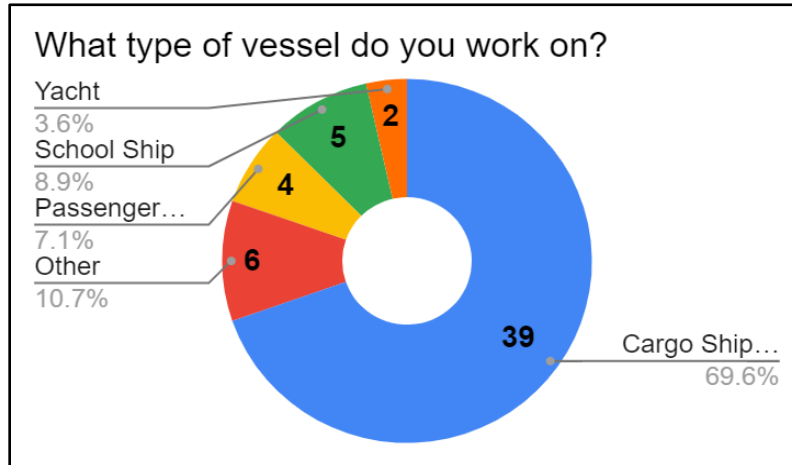
This survey was answered by 56 participants. Of these, 30 were from the Philippines, 14 were from Turkiye. The others were from Bulgaria, Romania, Honduras, and India.



The majority of the galley staff (that is 35,7% of them) who participated in the survey were between the ages of 26-35. Two of the participants were above the age of 56. 12 of them were female while 48 were male. The distribution of the respondents according to their age and gender be seen in the figure below.



The following figure shows that 39 participants, which makes up 69,6% of them, work on board cargo ships. The distribution of the types of ships that the participants work onboard is seen in the following figure.



PROPER NUTRITION AND WELL-BEING

“Please specify how much you agree with the following statements.”

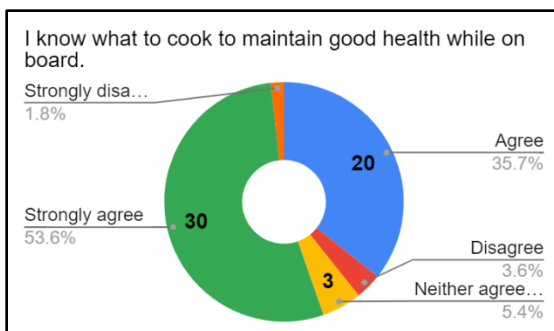
I know what to cook to maintain good health while on board.

I can prepare a balanced menu.

When planning the menu, I believe the goal is to achieve a balanced diet while ensuring satiety.

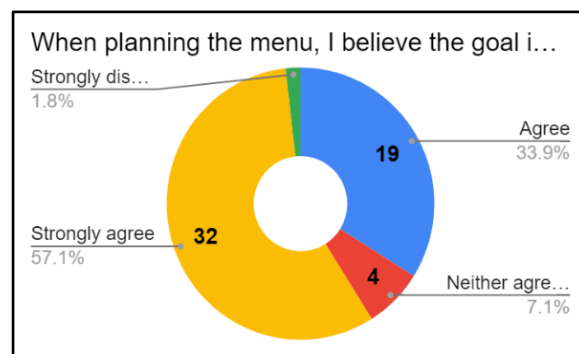
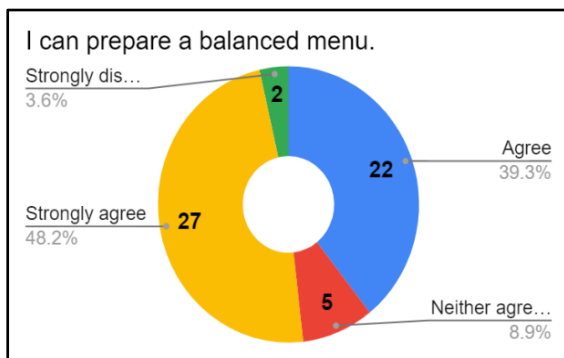
Having a nice meal at the end of the day increases the crew’s work motivation.

A study on the relationship between nutrition and well-being shows clear evidence of direct relationships between nutrition, susceptibility to stress, mental health and mental function throughout life, and even self-care for certain existing comorbidities. The quality of nutrition and unhealthy habits can significantly affect the quality of life. This can be significantly influenced by the quality and quantity of the food products that

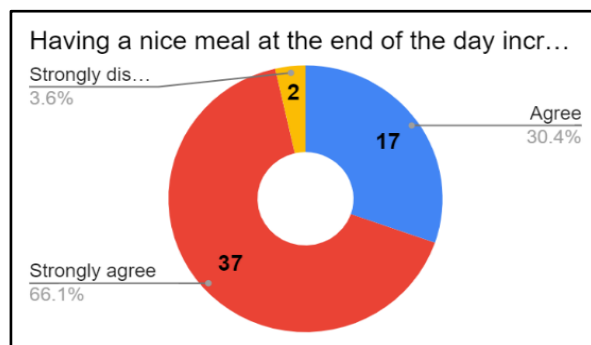


make up the daily diet, along with the adopted lifestyle. Based on this, in the first section, we wanted to find out about the galley staff’s awareness of the relationship between nutrition and well-being. The first sub-section in the “Proper Nutrition and Well-Being” section consists of four questions, all of which are prepared to see if the

galley staff are aware of the requirements and importance of a balanced and well-planned menu. As the responses show, a great majority of the galley staff think they know what they should cook to keep the crew healthy. This shows that the galley staff knew what and how much seafarers needed to eat to ensure a balanced diet. It means that they know the nutritional values and properties of foods and the food groups that seafarers need to work efficiently. 10,8% of the staff said they did not know what is necessary to maintain the good health of the seafarers, while 35,7% preferred the “Agree” choice instead of “Strongly Agree”. This may indicate that some staff need to be trained and some of the others need to get a refreshment training and equipped with detailed and up-to-date information.



The results show that galley staff know how to prepare such a menu and why eating a nice meal is important for the motivation of the crew. According to the results, about ten percent of the respondents did not know much about menu planning, but this is a low number compared to those who did. Nevertheless, it is very important to provide



general information about menu preparation and to refresh and renew the knowledge of galley staff on this subject.

“WellRight” says that Nutrition is an essential piece of the employee well-being puzzle. Employers have a responsibility to keep their staff’s best interests in mind at all times, and that remains the case when talking about food in the workplace. Beyond offering healthy food options on-site, employers need to go a few steps further to provide support and education about food access and healthy eating habits for all employees. Organizations must promote food equity for all employees by not only accommodating unique needs like food sensitivities and dietary restrictions but also actively informing and encouraging proper nutrition [1].

Nutrition plays an integral role in an employee's ability to "show up" at work. A healthy, well-balanced diet is one of the best performance enhancers for employee well-being, while a poor diet contributes to diminished productivity and stunted organizational growth. Employees who opt for predominantly unhealthy food choices are 66% more likely to be less productive than those who actively make healthy choices.

Evidence also shows that influencing work-related outcomes—especially absenteeism—is possible through complete and inclusive health promotion efforts in the workplace. Breaking it down further, proper nutrition also enables employees to enjoy:

- Increased cognitive function
- Better concentration
- More energy and motivation
- Decreased depression and anxiety
- Heightened self-esteem

These results are not specifically related to the performance and motivation of the seafarers and students who serve onboard for internship purposes, but they are of interest to all employees in general. Nevertheless, with this aspect, it can be inferred that it applies to everyone including seafarers.

Since the results emphasize the importance of food and nutrition, the opinions of the galley staff, who are directly related to food, were also sought. In this way, it will be possible to determine whether they are aware of the importance of the issue and whether they appreciate its significance. The questions that were asked about "Tasty Food and Its Impact" are given below together with the percentage of the responses.

"Please specify how much you agree with the following statements regarding *"Tasty food"*."

Tasty food contributes to a positive atmosphere on board by creating a feeling of comfort, enjoyment, and camaraderie.

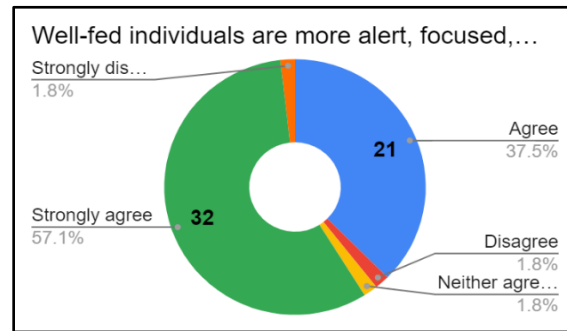
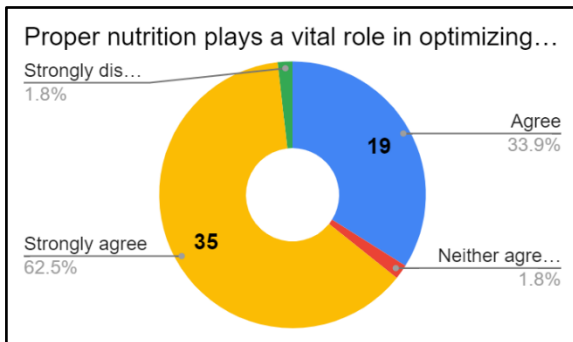
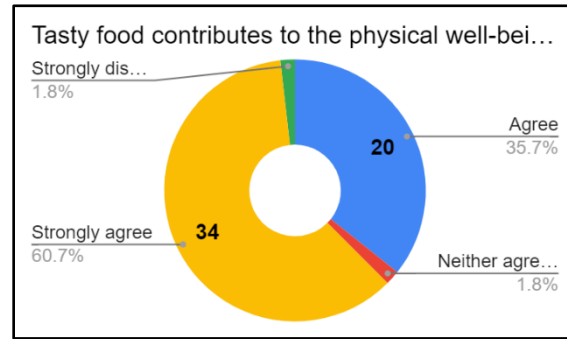
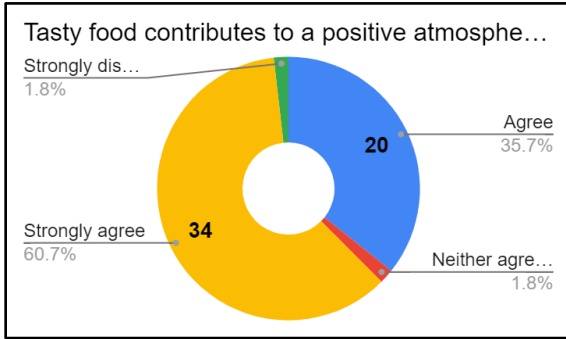
Tasty food contributes to the physical well-being of individuals on board

Tasty food can positively affect mental health by improving mood, cognitive function, and general well-being.

Well-fed individuals are more alert, focused, and productive, which is essential for the efficient and safe performance of tasks on board.

Proper nutrition plays a vital role in optimizing performance and productivity.

The responses given by the galley staff to the questions in this group can be seen in the following figures.



As the figures show, galley staff are aware of the importance of delicious meals and their positive impact on the crew. It is seen that about 95 percent are conscious of the importance of a tasty meal, which leads to the expectation that they will emphasize cooking tasty and nutritious meals.

Although these results show that galley staff are aware of the importance of good food and do not need additional training on the importance of food, some kind of refreshing training and examples of good practices could be provided for both new entrants and existing staff.

One of the important jobs the galley staff is expected to fulfill is to be able to prepare menus suitable for the tastes of staff from different cultures

To ensure that galley personnel onboard ships can meet the diverse dietary and cultural needs of a multinational crew, several strategies can be implemented. These strategies focus on enhancing training, improving communication, and ensuring flexibility in meal preparation. Here are some key approaches:

Cultural Awareness Training

- **Diverse Cuisine Training:** Galley personnel should receive training in preparing a variety of international dishes, particularly those common to the cultures represented on the crew. This includes understanding the key ingredients, cooking methods, and flavor profiles of different cuisines.

- **Cultural Sensitivity:** Training should also include cultural sensitivity awareness, helping cooks understand the significance of certain foods and dietary practices in different cultures. For example,

understanding religious dietary restrictions (e.g., halal, kosher, vegetarianism for religious reasons) is crucial.

Flexible Menu Planning

-Rotating Menus: Implement a rotating menu system that regularly includes dishes from different cultures. This can help ensure that all crew members have meals that are familiar and comforting to them at different points in the voyage.

- Customizable Options: Offer customizable meals where crew members can choose from a variety of options, allowing for adjustments based on dietary preferences and restrictions.

- Feedback Mechanism: Regularly gather feedback from the crew regarding the menu and food preferences. This can be done through surveys, suggestion boxes, or informal conversations. Use this feedback to continuously adapt the menu.

Ingredient Sourcing

- Stocking Diverse Ingredients: Ensure that the ship is stocked with a variety of ingredients that cater to different culinary traditions. This includes staples like rice, pasta, spices, and sauces from different cultures, as well as specialized items like halal or kosher meats, vegetarian alternatives, and gluten-free products.

- Fresh Produce Management: Efficiently manage the storage of fresh produce and ingredients that are essential for specific cuisines, ensuring they are available when needed during the voyage.

Hiring Multinational Galley Staff

- Diverse Culinary Team: Whenever possible, hire galley personnel from different cultural backgrounds. A multicultural galley team can bring a wider range of culinary expertise and better understand the preferences of a diverse crew.

- Language Skills: Encouraging or hiring staff with multilingual skills can improve communication between the galley and the crew, ensuring a better understanding of dietary needs and preferences.

Special Dietary Accommodations

- Dietary Restrictions Training: Galley personnel should be trained to handle a wide range of dietary restrictions, including allergies, religious diets, and health-related dietary needs (e.g., low-sodium, diabetic-friendly).

- Clear Labelling: Ensure that all meals are clearly labeled, indicating ingredients, potential allergens, and compliance with dietary restrictions like halal, vegetarian, or gluten-free.

Regular Collaboration with the Crew

- Crew Representatives: Appoint crew representatives from different nationalities or cultural groups to collaborate with the galley staff in planning meals. This ensures that the needs and preferences of all crew members are considered.

- Cultural Celebrations: Incorporate meals that celebrate various cultural or national holidays observed by the crew, fostering a sense of inclusion and respect for different traditions.

Continuous Professional Development

- Ongoing Culinary Training: Provide opportunities for galley personnel to attend culinary workshops or courses that focus on international cuisine and new dietary trends. This ensures they stay up-to-date with the latest culinary practices.

- Exchange Programs: Implement exchange programs or partnerships with other ships or culinary institutions where galley personnel can learn about different culinary traditions and practices.

Technological Support

- Recipe Software: Use software that helps galley staff manage recipes, plan menus, and track dietary restrictions. These tools can help ensure that meals are consistently prepared to meet the diverse needs of the crew.

- Online Resources: Provide access to online resources, recipes, and cooking tutorials that focus on international cuisine, allowing galley staff to expand their repertoire.

In summary, meeting the dietary and cultural needs of a multinational crew requires a combination of specialized training, flexible menu planning, and active communication with the crew. By implementing these strategies, ship owners can ensure that galley personnel are well-equipped to provide meals that satisfy and respect the diverse backgrounds of the crew, thereby enhancing overall morale and well-being on board.

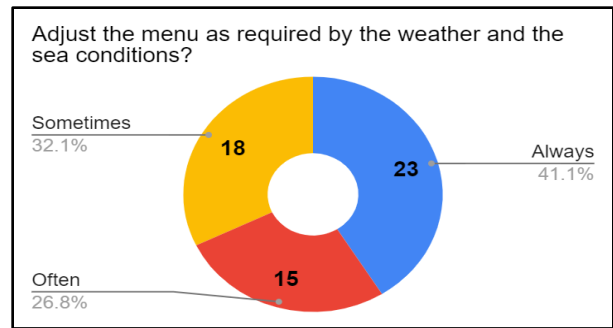
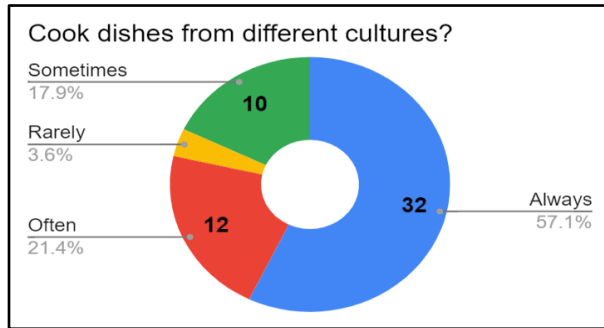
“Thinking about your cooking skills, how often do you... (%)”

Cook dishes from different cultures?

Adjust the menu as required by weather and sea conditions?

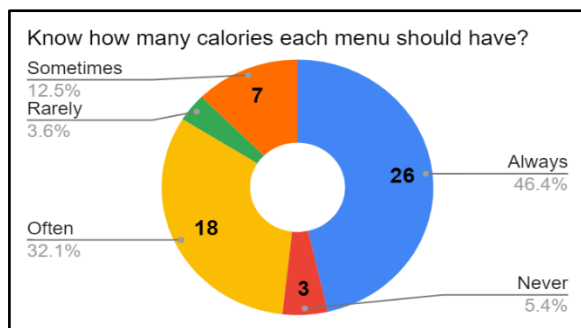
Know how many calories each menu should have?

Adjusting the menu to the needs and expectations of the seafarers and cooking food from different cultures is a motivating factor for the seafarers. On the other hand, sometimes they should cook the kind of food suitable for the special conditions, whether expected such as feast days, festivals, holy days, or unexpected such as inclement weather or pandemic disease. The galley staff should be flexible to meet these various kind of demands.



The survey results show that 78,5% of the galley staff are aware of the need to cook food from different cultures and they can cook them, and 66,9% of them are flexible enough to adjust the menu to the needs of the conditions onboard. However, 25% of them still need to get training regarding this section, while the others learn more recipes from various cultures and how food from quite different cultures can be integrated to have a better combination regarding the menu on board.

Probably the most important issue that galley staff need to be knowledgeable and aware of is the nutritional value of food and how much of each food group seafarers need to eat to be healthy and happy. A menu



prepared by people with this knowledge will not only ensure a healthy and adequate diet but also help to keep seafarers' well-being and motivation high. To understand this, the galley staff were first asked whether they were aware of how many calories an average menu should contain.

The responses show that 78.5% of the participants consider themselves conscious and well-informed about this issue. However, 12.5% stated that they were unsure about this topic, while the remaining 9% stated that they knew little or nothing about it. This shows that a small part of the galley staff needs solid training on this subject, while the other part would be good for refreshing and updating their knowledge.

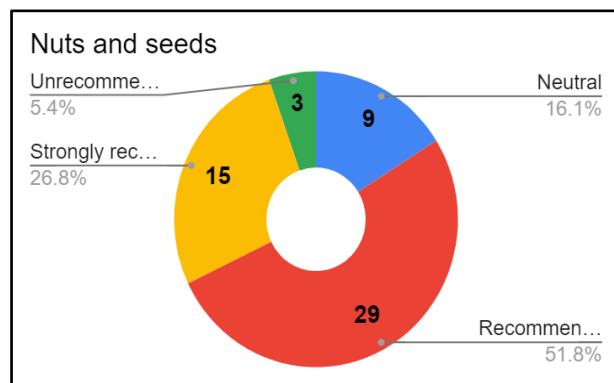
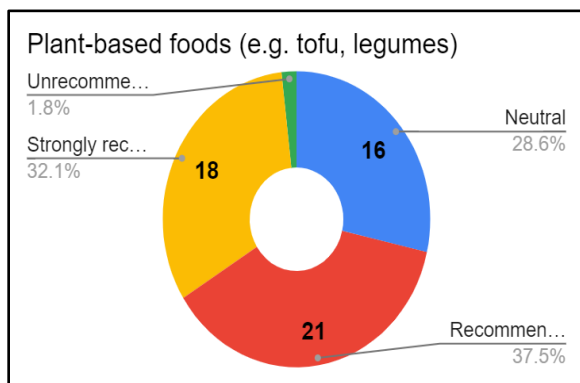
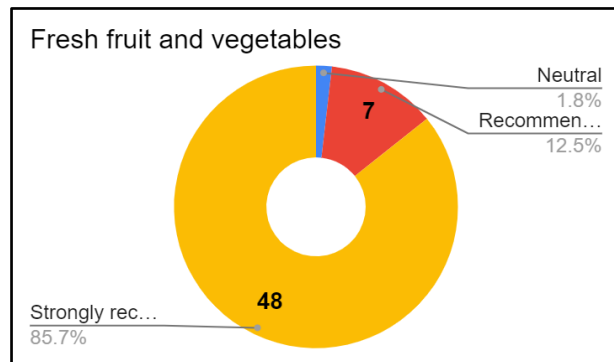
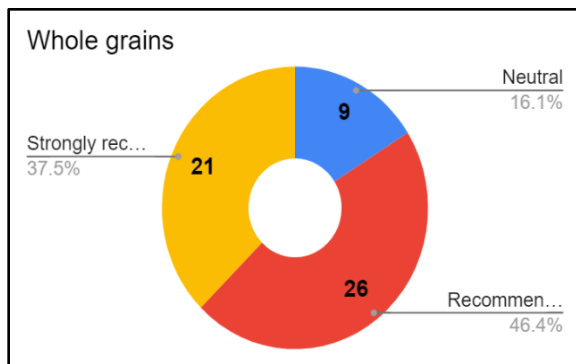
A study on ISWAN's website says that good, tasty food is vital to seafarers – it always comes up when seafarers are surveyed. A seafarer's quality of life can also be seriously impacted if they do not have access to nutritious food. Chronic diseases are linked to poor diets – usually, those high in calories, added sugars,

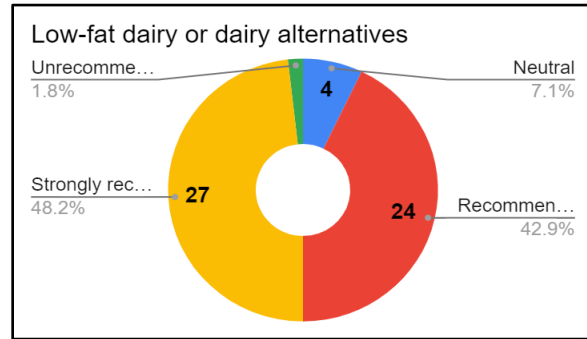
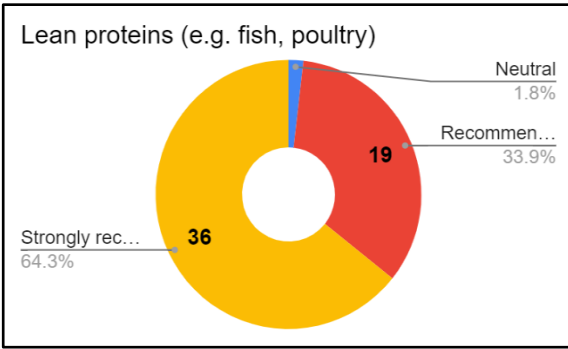
and fat – and unhealthy food obtained at work. Rough working schedules on board result in poor nutritional choices and often go against health recommendations. Food services should offer easy and accessible resources to all food handlers, especially while on board, including healthy food options and guidelines on nutrition [2].

A healthy diet involves the intake of highly nutrient-dense foods from key food groups in the recommended quantities and calories: fruits, vegetables, whole grains, low-fat dairy products, protein, and healthy oils. Dietary guidelines also suggest limiting the consumption of food and beverages that are high in sugar, saturated fat, and sodium. By following a healthy diet, seafarers can minimize their risk of developing a chronic disease. Healthy eating can be the best medicine in providing preventive barriers against chronic disease and promoting a healthy lifestyle.

Based on this information, it is clear that some food groups should be available on board at all times and under all conditions. Considering the answers given to the questions asked to assess the knowledge of the galley personnel on the necessity of basic foodstuffs, it is concluded that the personnel in question are quite knowledgeable and conscious about this issue.

“Please specify which food groups should be readily available onboard ships. (%)”





Considering the “would recommend” and “strongly recommend” responses to the questions in this subsection, it was revealed that the food groups that the galley staff most recommended to be available on board the ship were fresh fruit and vegetables and lean protein such as fish or poultry. These food groups were recommended by 98.2% of the galley staff, followed by low-fat dairy or dairy alternatives by 91.1%, cereals by 83.9%, nuts and seeds by 78.6%, and plant-based foods like tofu or legumes by 69.6%.

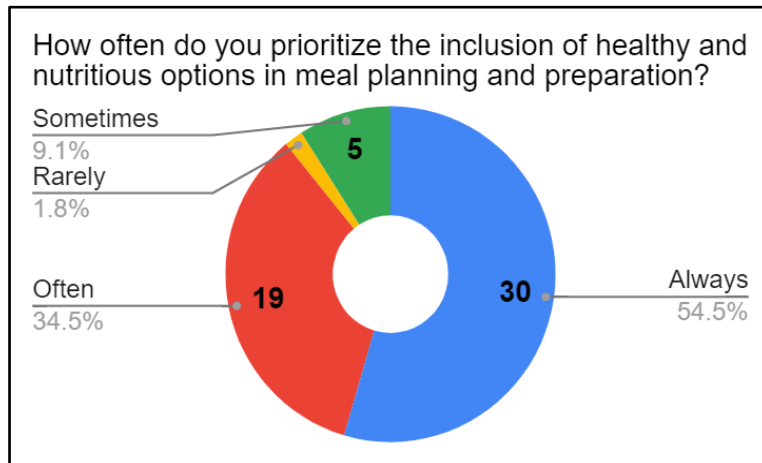
It can be argued that “nuts and seeds” and “plant-based foods like tofu or legumes” are not given the importance they deserve. However, incorporating a variety of nuts and seeds into the diet provides numerous health benefits (for people without allergies to nuts). Nuts and seeds have a high nutrient density, offering proteins, fibers, monounsaturated and polyunsaturated fats, and various vitamins, minerals, and phytochemicals. Despite being excluded from the 5-a-day recommendations, their positive impact on various non-communicable diseases and weight management makes them valuable additions to a healthy balanced diet [3].

On the other hand, plant-based foods, which have not received the importance they deserve from the galley staff, are increasingly becoming a common part of the human diet because of sustainability, cost, and availability. Plant-based foods are associated with many health and nutritional benefits such as reduction in obesity, and cancers, as well as the risk for cardiovascular diseases. Plant-based foods also have considerable levels of macro and micronutrients in addition to the presence of several bioactive compounds such as phytochemicals, which are beneficial to human health if the processing applied to the foods is not too drastic [4].

In light of this information, it was concluded that it would be advisable to inform the galley staff about the appropriate foods to be kept in the galley, and their benefits for health.

Eating is not just about filling the stomach. Seafarers may not have much choice in this matter; they can only eat the meals prepared by the cook. However, it is important that the cook or the person who prepares the menu considers the special conditions of working on board and tailors the menu to meet the nutritional needs of seafarers. The study revealed that the galley staff on board were very conscious of this issue.

The question “How often do you prioritize the inclusion of healthy and nutritious options in meal planning and preparation? (%)” was answered by 89% of the participants as “always” or “often”. Only 10,9% of them said they ignored the fact that the food onboard should be healthy and nutritious. Normally, this small percentage can be considered negligible; however, when the health of seafarers is in question this is not an ignorable number of respondents, and some precautions should be taken to make these staff more aware of the crucial role of food for seafarers.



SUSTAINABILITY

Fundamental ecological problems such as resource scarcity, drinking water shortages, pollution and environmental disasters, and global warming have become more important in recent years [5]. Hunger and poverty are also on the rise, while biodiversity has been declining in recent years. *Sustainability, which is the ability to exist and develop without depleting natural resources for the future, has gained importance as a solution to all the problems that threaten our world* [6].

Sustainability has three pillars or principles of environmental, social, and economic sustainability, also known as ESG (Environmental, Social, Governance). The 3Ps of sustainability are a well-known and accepted business concept. The Ps refer to People, Planet, and Profit, also often referred to as the triple bottom line. Sustainability has the role of protecting and maximizing the benefit of the 3Ps [7].

Sustainability in the Maritime sector encompasses digitalization and optimization of logistics, vessel optimization, and electrification, alternative low- and zero-carbon fuels, as well as port decarbonization and infrastructure for renewable energy generation and storage and alternative fuels production, transport, and storage [8]. In the maritime sector, special attention is paid to implementing practices that include ships. It is also important to implement sustainability practices in the ship's galley. Some studies have been

conducted on sustainability practices that can be implemented in the ship galley. According to these, the main sustainability practices can be as follows:

Steps to ensure sustainability in a ship's galley

Ensuring sustainability in a ship's kitchen (galley) involves adopting practices that minimize environmental impact, conserve resources, and reduce waste. The following strategies are advisable to follow:

Efficient Food Management

- Menu Planning: Design menus based on seasonal and locally sourced ingredients, reducing the carbon footprint associated with food transportation.
- Portion Control: Serve appropriate portion sizes to minimize food waste.
- Inventory Management: Use a first-in, first-out (FIFO) system to reduce food spoilage and waste.
- Leftovers Utilization: Incorporate leftovers into new dishes to avoid waste.

Sustainable Sourcing

- Sustainable Seafood: Purchase seafood from sustainable fisheries and avoid species that are overfished.
- Local and Organic Produce: Source fruits, vegetables, and other products from local and organic farms, reducing transportation emissions and supporting sustainable farming practices.
- Fair Trade Products: Choose fair trade-certified products to ensure ethical sourcing and support sustainable livelihoods for producers.
- Avoid greenwashing

Energy Efficiency

- Efficient Appliances: Use energy-efficient cooking equipment and appliances to reduce energy consumption.
- Temperature Management: Maintain optimal temperatures in refrigerators and freezers to avoid energy waste and food spoilage.
- Alternative Cooking Methods: Utilize cooking methods that consume less energy, such as steaming or pressure cooking.

Water Conservation

- Water-Saving Appliances: Install low-flow faucets and dishwashers that minimize water usage.
- Efficient Washing Practices: Encourage the crew to use minimal water when cleaning and rinsing dishes.
- Greywater Recycling: Where possible, implement systems to recycle greywater for non-potable uses.

Waste Reduction

- Composting: Set up a composting system for food scraps that can be composted, reducing the amount of waste.
- Waste Separation: Implement a system to separate recyclables from general waste to improve recycling rates.
- Biodegradable Packaging: Use biodegradable or reusable containers and packaging materials to minimize plastic waste.

Crew Education and Engagement

- Training: Educate the crew on sustainable practices, such as reducing waste, conserving water, and using energy efficiently.
- Incentives: Offer incentives for crew members who actively contribute to sustainability efforts.
- Continuous Improvement: Encourage feedback from the crew and regularly review practices to identify areas for improvement.

Sustainable Cleaning Practices

- Eco-Friendly Cleaning Products: Use environmentally friendly cleaning products that do not harm marine ecosystems.
- Reusable Cleaning Tools: Opt for reusable cleaning cloths and tools instead of disposable ones.

Sustainable Packaging and Supply Chain

- Bulk Purchasing: Buy in bulk to reduce packaging waste.
- Sustainable Suppliers: Choose suppliers who prioritize sustainability in their operations, such as reducing plastic use or offsetting carbon emissions.

By integrating these practices into the ship's galley operations, you can significantly enhance sustainability, reduce environmental impact, and contribute to the overall sustainability goals of the ship.

Recycling Garbage [9]

Health- and vetting inspectors watch garbage handling, so it can be ensured it's hygienic and following the ship's Garbage Management Plan. If something is mixed, such as plastic and paper, they should be sorted according to the content. For example, if a carton consists of 70% paper and 30% plastics it should be sorted as paper [10].

The following items are to be recycled:

1. Plastics.
2. Metal.
3. Paper.
4. Glass.
5. Organic waste.
6. Oil.

As these practices show, this important issue needs to be internalized and supported by the ship's kitchen staff as well as everyone else. In this part of the survey, the opinions and approaches of the galley staff about the sustainability practices that can be implemented in the ship's galley were aimed to be evaluated.

“Thinking about your cooking practices, how often do you... (%)”

Avoid behaviors that may cause waste in the galley?

Make new dishes by using the leftovers of meals that were not served?

Pay attention to the expiration date of food items?

Use disposable plastic materials on the table?

Ensure the use of glass cups or thermos for water service?

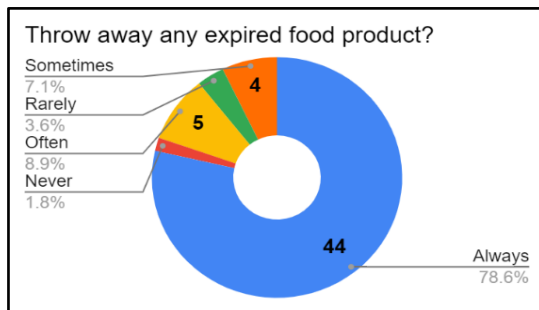
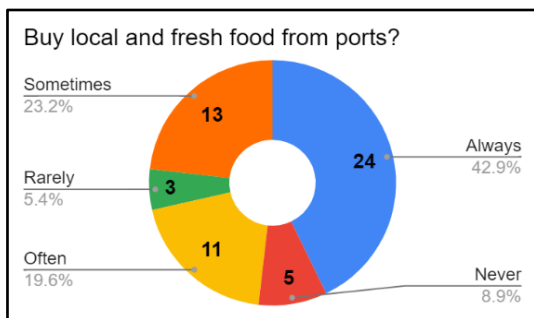
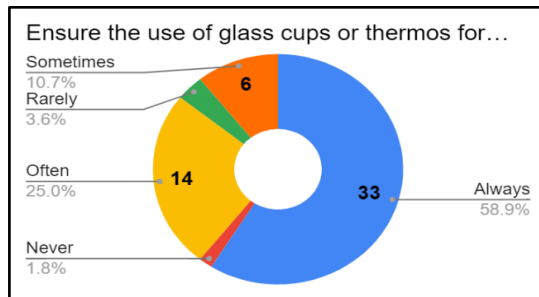
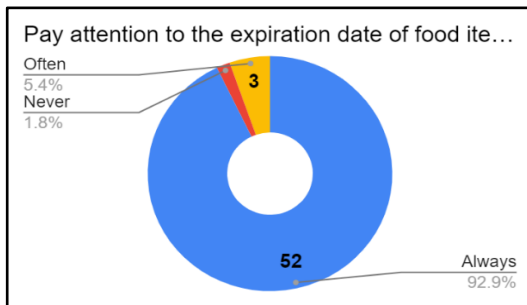
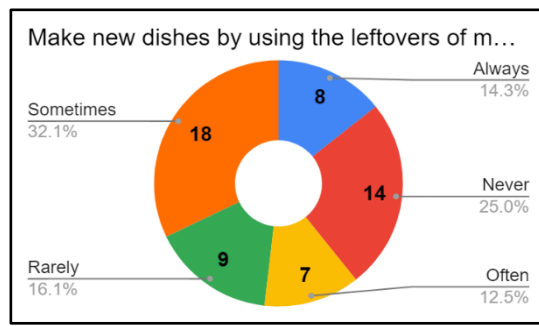
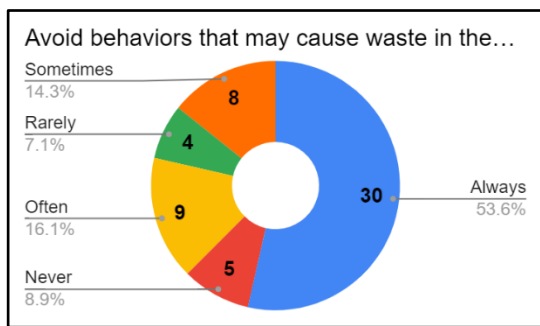
Buy local and fresh food from ports?

Throw away any expired food product?

It is seen that the galley staff are quite conscious about avoiding behaviors that may cause waste in the galley. 98,3% of them indicated they pay attention to the expiration date of the food onboard, which means they consume it before that date not to waste it. Despite their attention, some food may be expired. 87,5% of the staff throw away these products. 69,7% of the staff said they are careful about not creating waste in the galley. Using disposable plates and cups in the galley causes both environmental pollution and increased

waste of raw materials. It was observed that 62.5% of the galley staff avoided using disposable materials. One of the important steps to be taken in the galley in terms of sustainability is to shop from local producers, and the other is to use the unserved leftover food for the next meal and make different dishes from the leftovers. The survey results show that 62.5% of the galley staff prefer local producers when shopping, and 26.8% utilize leftover food in subsequent meals.

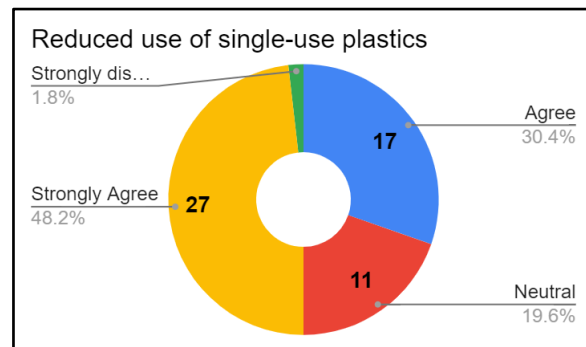
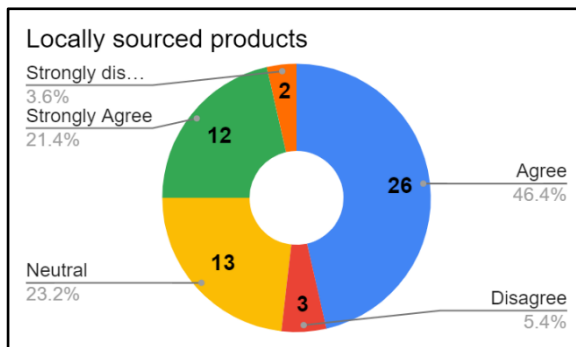
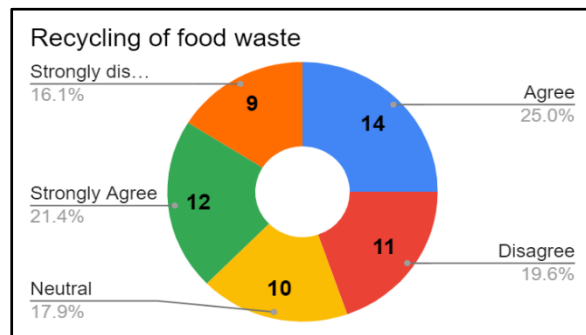
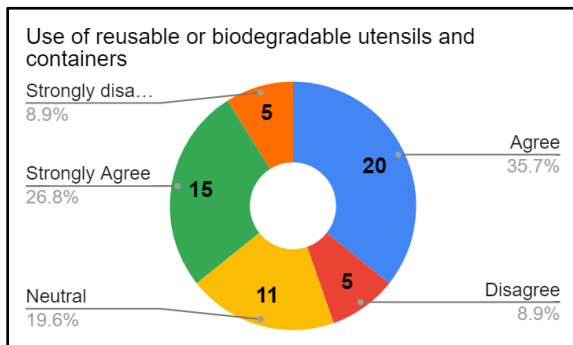
Considering the results of the survey, it can be concluded that the staff in the galley need training on the problems caused by disposable materials usage. They should also learn about the importance of using local products and making new meals from leftovers.



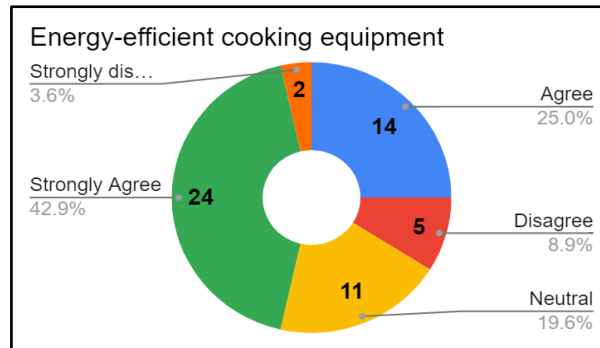
Another question to assess if the galley personnel are aware of the practices related to sustainability that could be implemented onboard is the following.

“Which of the following environmental practices could be implemented in the galley operations onboard ships? (%)”

The responses to the questions in this section indicate that galley staff think reduced use of single-use plastics and energy-efficient cooking equipment usage are two of the practices that can be implemented widely. 78,6% of the respondents said they are for reduced use of single-use plastics while 67,9% said energy-efficient cooking equipment can be used for environmental purposes. Using locally sourced products (67,8%) was also supported by the respondents a lot. 62,5% of the participants indicated that reusable and biodegradable utensils and containers can be used to support environmentally friendly activities in the galleys onboard. Surprisingly, only 46,4% of the participants supported recycling of food waste. 5,7% of the staff disagree or strongly disagree with recycling food waste while 17,9% of them have no idea.

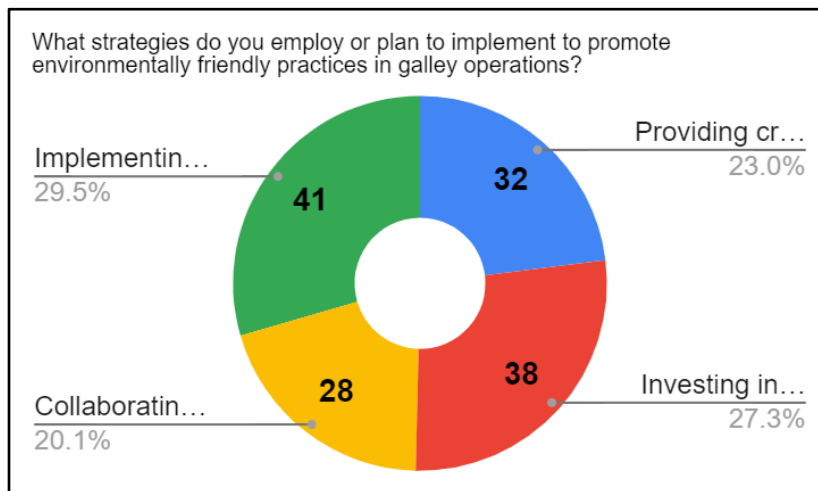


These results indicate that the galley staff needs education and training on environmentally friendly activities onboard, especially regarding recycling food waste. Although most of them are aware of what can be done to ensure the activities in the galley are environmentally friendly and support sustainability, it will be better for them to get refreshment training for up-to-date activities to support sustainability and to have a mindset more inclined to implement these activities.



“What strategies do you employ or plan to implement to promote environmentally friendly practices in galley operations? (Select all that apply) (%)”

	%
Implementing waste management and recycling programs	29,5
Investing in eco-friendly equipment and technology	27,3
Providing crew training on sustainable practices	23
Collaborating with suppliers to source sustainable ingredients	20,1



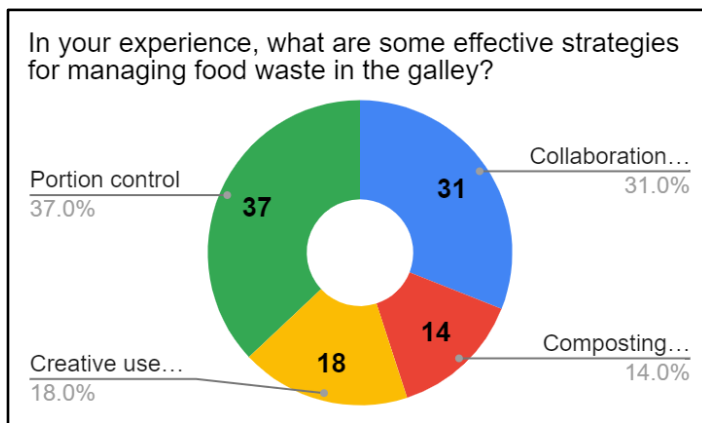
All the choices suggested by the galley staff have been and can be practiced in the galleys. Implementing waste management and recycling programs may be the most easily practiced one since all individuals can do it by themselves, it does not require long training or special gadgets.

It is necessary to follow the developments in the field of environmentally friendly practices in galleys to provide refreshment training for the staff. They should know what steps they can take both

individually and together with the other members of the galley staff to provide sustainability in the galleys.

“In your experience, what are some effective strategies for managing food waste in the galley? (%)”

	%
Portion control and meal planning	37
Creative use of leftovers in subsequent meals	18
Composting organic waste	14
Collaboration with crew members to minimize plate waste	31



The responses given to the questions in this section are in parallel with those of the previous questions in this section. It is understood that the staff needs training and education regarding how to make use of left-over food, how to recycle it, and how to compost organic waste. These needs are closely connected with the requirements for the circular economy, so it can be said that the staff needs education and training regarding the circular economy.

HYGIENE

Maintaining high standards of cleanliness and hygiene in galley and storeroom areas onboard ships is of paramount importance, as these spaces serve as the epicenter of food preparation and storage. Not doing so will have a direct impact on the health and safety of the crew. Galley staff must adhere to rigorous flag-state hygiene practices. This not only prevents foodborne illnesses but also safeguards the integrity of provisions, sustains crew morale, and ensures compliance with international maritime regulations, ultimately fostering a healthy environment crucial for successful maritime operations [11].

Keeping Stores and Working Areas Clean

Efficiently organizing your food products within refrigerators, freezers, and dry stores is key to ensuring a clean and efficient galley area. You should allocate distinct spaces for dairy products, meat, fish, and vegetables, to ensure that there is no cross-contamination during storage. Safeguard the freshness of perishables by covering them with plastic foil to prevent both drying and contamination when in the chilled or dry storage areas. When it comes to food preparation, employ separate cutting boards tailored to different food types. Many such boards conveniently come in various colors for easy differentiation.

When managing the stores onboard, encourage the use of older items first while vigilantly monitoring expiration dates. Arrange new items towards the back of shelves, granting easy access to the older stock. This will ensure that older foods are used in good time and there is a low level of wastage.

To improve the health of those onboard without compromising on hygiene in the galley, consider embracing the effectiveness of ordinary white vinegar as a natural cleaning alternative instead of resorting to harsh chemicals. Thoroughly wipe down knives, workbenches, cutting boards, and other galley utensils with vinegar, extending its utility to cleaning refrigerator shelves prone to black mold growth.

Weekly Galley Inspection

Every week, the galley should be inspected by the Master or their representative. This inspection will check that the galley, storerooms, and all food handling areas are clean and in good working condition. Before this inspection takes place, you should ensure that:

- The grease filters and grease traps over the stove are cleaned.
- The benches are clean and dry.
- Nothing is stored under the benches on the floor.
- All fridges are clean inside as well as outside.
- The freezer is organized and clean, and nothing is stored on the floor.
- The dry store is cleaned and nothing is stored on the floor.
- You wear safety shoes and clean clothes.
- The garbage or food waste is covered and recycled according to the onboard garbage management plan
- Your resting hours have been documented every day.
- Maintain the logs of the temperature in the fridges and the freezers and that the temperatures are correct. Fridge maximum +8° Celcius and freezer minimum -18° Celcius.

Port State Control Inspections

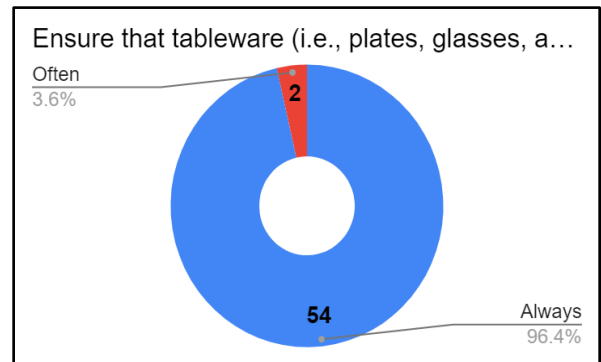
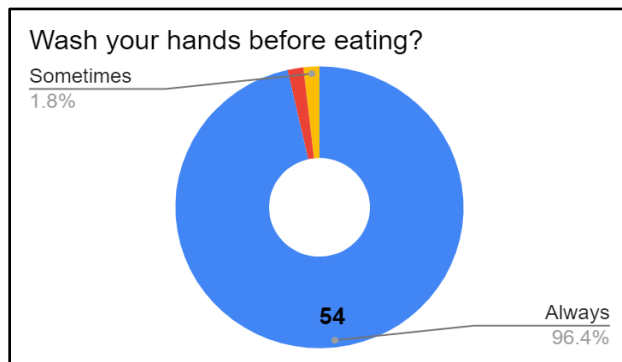
Often, health inspectors come on board for galley inspection when the vessel is in port. This is liable to happen without previous notice. Before coming into port, the galley staff should ensure that the galley is ready for any such inspection. In addition to the preparations for the weekly inspection, the galley staff should ensure that:

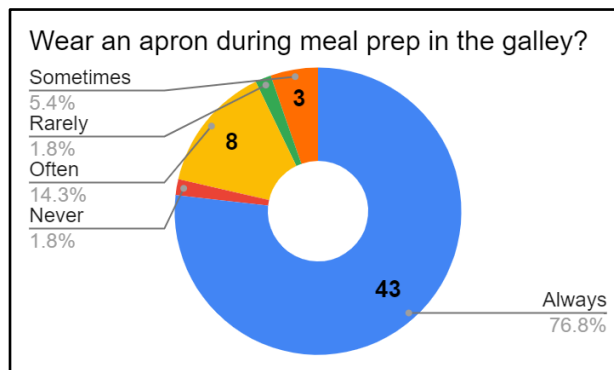
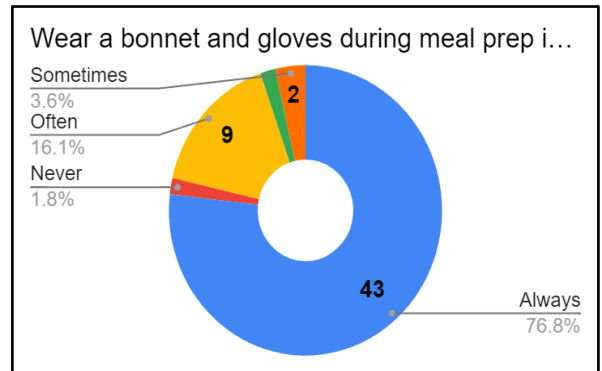
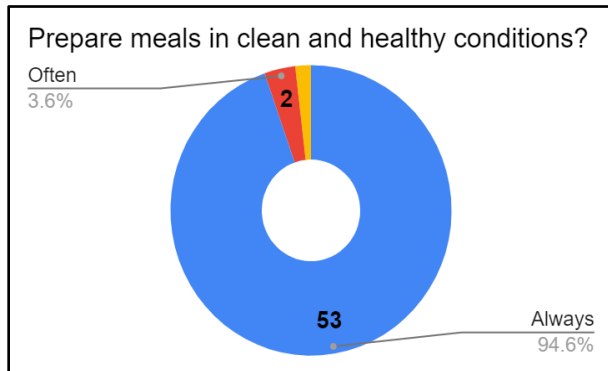
- All raw and cooked ingredients, fish, meat, vegetables, and dairy are suitably segregated in storage.
- All leftovers and salads are covered and dated for use.
- Different cutting boards for different products are used - vegetables, meat, chicken, and fish.
- All personnel in the galley are wearing clean clothes and safety shoes.

It's important to keep the galley and tools clean. Not only to keep the bacteria and dirt away but also to keep the galley neat and organized for visiting shore personnel and inspectors, it is always nicer to work in a clean and proper environment [12, 13].

“Thinking about your hygiene, how often do you... (%)”

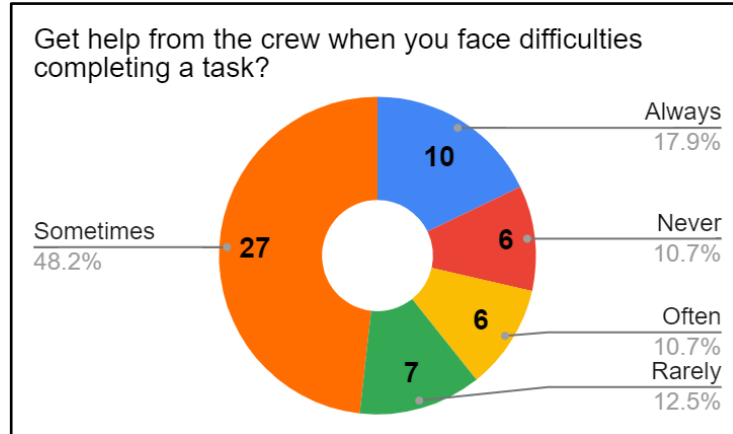
- Wash your hands before eating
- Ensure that tableware (i.e., plates, glasses, and cutlery) is properly clean.
- Prepare meals in clean and healthy conditions
- Wear a bonnet and gloves during meal prep in the galley
- Wear an apron during meal prep in the galley





As the figures suggest, the galley staff are careful about hygiene and they obey basic rules to keep the galley clean. However, the rule of wearing a bonnet, gloves, and apron during the cooking process is sometimes violated. Although 76,8% of the staff always put on them, 16,1% said they do this often, which means they sometimes do not wear a bonnet or gloves. 1,8% of the respondents said they never put on a bonnet. Similar responses were given for wearing an apron. 76,8% of the staff said they always put on an apron in the galley but 14,3% said they often wear it, which also means there are times they do not put on an apron. 3,6% of them said they never or rarely wear it. It is concluded that one-fourth of the staff violate an important rule regarding hygiene in the galley.

“How often do you get help from the crew when you face difficulties completing a task? (%)”



28,6% of the respondents always or often get help from the crew who are not authorized to go into the galley while 42,8% sometimes do so. It is dangerous for these people to work in the galley both in terms of safety and hygiene since they do not know anything about the galley, especially the rules specific to the galleys. However, the responses show that this issue is not given proper importance. Therefore, it is seen that galley staff need training on hygiene and people who can work in the galley.

The galley is one of the most critical compartments on board providing to crew members (and if applicable to passengers) the required food and beverage services daily. Maintaining the proper quantity and a high quality of food and beverage is of high importance for the crew members considering that both their performance at work and their health depend on it. Galleys are subject to MLC inspections, therefore, they must be kept in such a condition that will not cause food-borne diseases, which can put vessel and crew in danger and consequently shipowners to face unexpected costs.

Any food spoilage or contaminated food can cause food poisoning, therefore, galleys need to follow proper hygiene to maintain food of high quality. Even if the loaded food is safe, this does not ensure that it will remain safe during the storage, preparation, cooking, and serving activities that follow on board. The main risks to food safety in the galley, storage facilities, and service areas are related to the following:

Biological hazards (bacteria, viruses, fungi, and parasites)

Biological hazards occur when bacteria, viruses, molds, yeasts, or parasites contaminate food. These organisms are commonly associated with humans and with raw products entering food preparation sites. Therefore, raw ingredients in the galley are high-risk factors. Storage time and temperature of food, as well as awareness and implementation of hygienic practices by food handlers on board ships, also play a significant role in food safety.

Chemical hazards (e.g. cleaning agents)

Chemical contamination of food may inadvertently occur ‘naturally’ before loading or during processing (e.g. by the misuse of cleaning chemicals or pesticides). Examples of naturally occurring chemicals are mycotoxins (e.g. aflatoxin), scombrototoxin (histamine), ciguatera toxin, and shellfish toxins.

Equipment and utensils

The equipment and utensils contacting food are designed and constructed to ensure that, when necessary, they can be adequately cleaned, disinfected, and maintained to avoid the contamination of food. Equipment and containers are typically made of materials with no toxic effects when used as intended. Where necessary, equipment should be durable and movable, or capable of being disassembled to allow for maintenance, cleaning, disinfection, monitoring, and inspection for pests.

Major risk factors that contribute to foodborne outbreaks on board ships are primarily associated with temperature control of food, infected food handlers, cross-contamination, heat treatment of perishable food, contaminated raw ingredients, and use of non-potable water in the galley. Some diseases can be transmitted from one country to another by infectious agents or contaminants due to poor control measures on board. Therefore, detecting contamination in the sources, preparation, and processing of food, as well as in the service of food in mess rooms, is crucial for the prevention and control of foodborne disease.

Recommendations

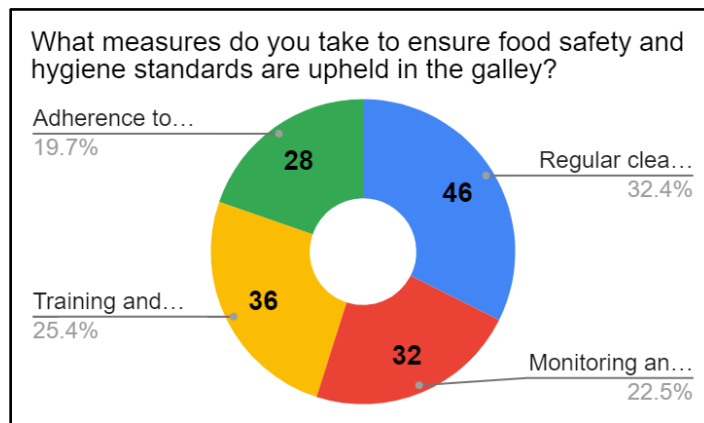
To address the issues related to food the following five (5) important checks form a best practice guide:

1. Have written policies for food loading, storage, and preparation. A food safety plan is a good solution.
2. Follow detailed personal hygienic rules. Posters and instructions always provide adequate guidance.
3. Storage compartments should be clean, free of pests or insects, with adequate temperature.
4. Catering personnel to be trained and focused on rules.
5. Health and safety issues in the galley area to be highlighted during food preparation and equipment use. <https://safety4sea.com/cm-how-to-maintain-galley-hygiene-onboard/>

Ensuring food safety and hygiene standards is an important issue in the galleys. The following question aims to find out what measures are taken for this purpose.

“What measures do you take to ensure food safety and hygiene standards are upheld in the galley? (%)” %

Regular cleaning and sanitation protocols	32,4
Training and education on food safety practices	25,4
Monitoring and recording of temperature controls	22,5
Adherence to food storage and handling guidelines	19,7



It is seen that 32,4% of the respondents think that the most widely taken measure for safety and hygiene is obeying the protocols for regular cleaning and sanitation. It is followed by training and education on the issue and monitoring and recording of temperature controls. The last choice, adherence to food storage and handling guidelines, is the least practiced one according to the responses. All these measures are equally important and should be taken by the staff without exception to keep the galley hygienic. Although the staff seems to be aware of the importance of hygiene in the galley, training can be provided at specified intervals to refresh their knowledge and inform them about emerging threats that may cause problems.

VICTUALLING

Importance of victualling onboard

Victualling onboard a ship refers to the provisioning and management of food and other essential supplies for the crew during a voyage. The importance of victualling cannot be overstated, as it directly impacts the health, morale, and overall functioning of the crew, as well as the success of the voyage. Here are some key reasons why victualling is critical onboard:

1. Crew Health and Well-Being

- Nutritional Balance: Proper victualling ensures that the crew receives balanced and nutritious meals, which are vital for maintaining physical and mental health, particularly during long voyages.
- Preventing Illness: Adequate nutrition helps prevent malnutrition and diet-related illnesses, which can be especially important when medical care is limited at sea.
- Hydration: Ensuring a sufficient supply of fresh water and beverages is essential to prevent dehydration, especially in harsh maritime environments.

2. Crew Morale and Productivity

- Morale Boost: Good food can significantly boost morale, making life at sea more enjoyable and reducing stress and fatigue. A well-fed crew is likely to be happier and more motivated.
- Energy Levels: Proper meals provide the energy needed for physically demanding tasks, improving overall productivity and ensuring that the crew can perform their duties effectively.
- Mental Health: Varied and satisfying meals can also support mental well-being, which is crucial for coping with the challenges of long periods away from home.

3. Operational Efficiency

- Sustained Operations: Adequate provisions ensure that the ship can operate without interruptions due to food shortages. This is particularly important during long voyages or when access to ports is limited.
- Minimizing Downtime: Proper victualling minimizes the risk of illness among the crew, reducing the chances of downtime due to medical emergencies or crew incapacitation.

4. Safety Considerations

- Alertness and Vigilance: A well-fed crew is more likely to remain vigilant, which is crucial for maintaining safety standards onboard and preventing accidents.
- Emergency Preparedness: Having enough provisions also prepares the ship for unexpected delays or emergencies, such as being stranded at sea longer than anticipated.

5. Logistical Efficiency

- Effective Planning: Proper victualling requires careful planning and inventory management, ensuring that the ship carries sufficient supplies for the entire voyage without overloading, which could impact fuel efficiency and storage space.

- Cost Control: Efficient victualling helps control costs by minimizing waste, reducing emergency need resupplies, and optimizing the use of available resources.

6. Compliance with Regulations

- Regulatory Compliance: Maritime regulations often require that ships carry a certain number of provisions based on the size of the crew and the duration of the voyage. Proper victualling ensures compliance with these regulations, avoiding penalties and ensuring the ship's readiness for inspection.

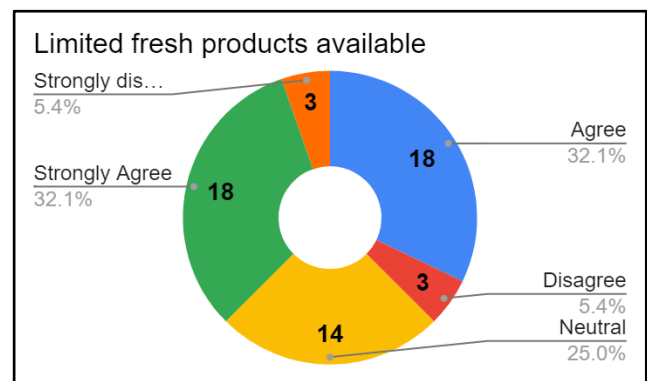
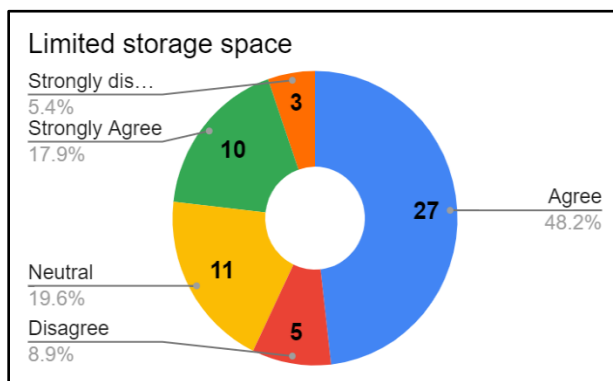
7. Sustainability and Environmental Impact

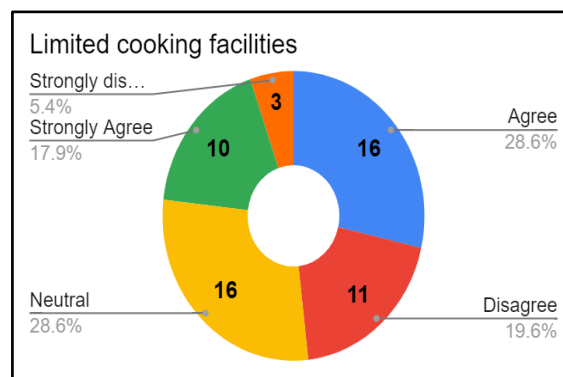
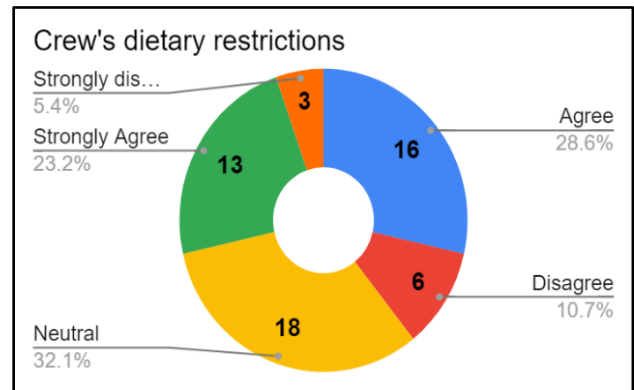
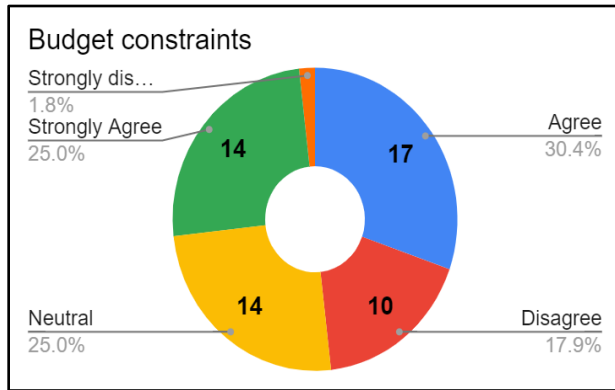
- Waste Management: Effective victualling helps reduce food waste, which is important for both operational efficiency and minimizing the ship's environmental footprint.

- Sustainable Practices: Incorporating sustainable sourcing and waste reduction practices in victualling contributes to the broader environmental goals of the maritime industry.

In summary, victualling is essential for ensuring the health, safety, and morale of the crew, maintaining operational efficiency, and complying with maritime regulations. Proper management of provisions is a key aspect of successful and sustainable maritime operations [14].

“Which of the following do you consider the main challenges for providing healthy and nutritious food options onboard ships? (%)”

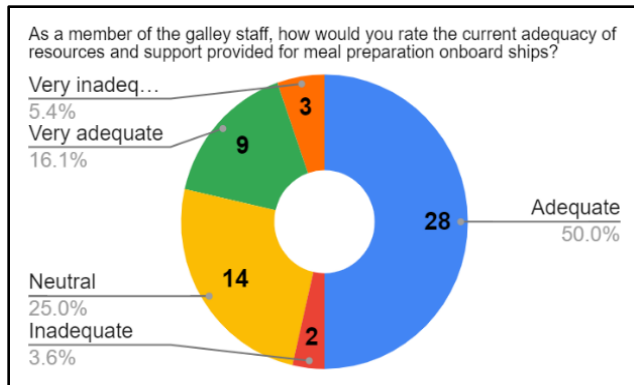




The challenges faced by kitchen staff in terms of food are given in order of importance and priority as identified by the staff. According to the results, limited storage space and limited fresh products available on board are seen as the most important problems by the galley staff. They are followed by budget restraints, dietary restrictions, and limited cooking facilities. The staff should try to take as many precautions as possible to overcome these negativities, inform those in management about the problems and try to eliminate them as much as possible.

“How would you rate the current adequacy of resources and support provided for meal preparation onboard ships? (%)”

Very inadequate	Inadequate	Neutral	Adequate	Very adequate
5,4	3,6	25	50	16,1



As the figure and the table show, 35% of the participants think the support and resources they get for meal preparation are inadequate. **Some respondents have no opinion on this issue, which can be interpreted as not finding the support adequate because they cannot give a clear, positive answer to the question. This result suggests that more resources should be**

provided to the galley and more support should be given for food preparation on board to ensure smooth operations.

TRAINING AND EDUCATION

Cooking personnel onboard ships, often referred to as ship's cooks or catering staff, typically receive specialized education and training to ensure they can safely and effectively prepare meals in a maritime environment. Their training is essential due to the unique challenges of cooking at sea, such as limited space, movement of the vessel, and the need to adhere to strict food safety standards.

Key Aspects of Education and Training for Ship's Cooks [15]

Basic Maritime Training

- STCW Certification: Ship's cooks and catering staff must usually undergo training as per the Standards of Training, Certification, and Watchkeeping for Seafarers (STCW) convention. This includes basic safety training, firefighting, and first aid.
- Security Awareness: Understanding maritime security protocols is particularly important in cases of emergencies or potential threats.

Culinary Skills

- Culinary Education: Many ship's cooks have formal culinary training, which covers food preparation, cooking techniques, and meal planning. Some may have certifications from recognized culinary schools.
- Menu Planning and Nutrition: Training includes creating balanced and nutritious meals suitable for the demands of life at sea, taking into account dietary restrictions and cultural preferences.

Food Safety and Hygiene

- HACCP Certification: Ship cooks are often required to have Hazard Analysis and Critical Control Points (HACCP) certification, which focuses on food safety and hygiene practices. This is crucial in preventing foodborne illnesses on ships.

- Safe Storage Practices: Training in safe storage techniques to preserve food quality and prevent contamination, especially in the challenging conditions of a ship's galley.

Specialized Maritime Training

- Galley Safety: Training includes how to safely operate in the confined and often unstable environment of a ship's galley. This includes understanding the secure storage of utensils, hot liquids, and equipment to prevent accidents.

- Efficient Use of Resources: Since space and resources are limited on ships, cooks are trained in maximizing the use of available ingredients and minimizing waste.

Emergency Preparedness

- Crisis Management: In the event of an emergency, ship's cooks are trained to manage food supplies, and ration meals, and ensure the crew is well-fed even under adverse conditions.

- Medical Training: Some basic medical training is often included so that catering staff can respond to minor injuries or illnesses that may occur in the galley.

Cultural Sensitivity and Adaptability

- Catering to Diverse Crews: Since ships often have multinational crews, cooks are trained to prepare meals that accommodate various cultural and dietary needs, ensuring inclusivity and maintaining morale.

Certification Requirements

In many jurisdictions, ship cooks are required to have a Certificate of Competency or equivalent qualification that verifies their ability to manage a ship's galley safely and efficiently. This certification is often mandated by maritime authorities and is part of the STCW requirements.

Continuous Training and Development

Given the evolving nature of maritime regulations and food safety standards, ship's cooks are often required to undergo continuous training and refresher to keep their skills and knowledge up to date.

In conclusion, it can be stated that a ship's cooks and galley personnel are generally well-trained and educated to meet the unique demands of cooking at sea. Their training ensures they can provide safe, nutritious, and varied meals while adhering to strict safety and hygiene standards, which is critical for the well-being and efficiency of the crew.

What kind of training programs for culinary skills and food safety practices can be necessary for galley staff? [15, 16, 17, 18]

Training programs for galley staff are crucial for ensuring that they possess the necessary culinary skills and food safety knowledge to operate efficiently and safely in the unique environment of a ship's galley. These programs should cover a range of topics, from basic culinary techniques to advanced food safety practices, tailored to the specific needs of maritime operations. Here are some essential training programs for galley staff:

1. Culinary Skills Training

- **Basic Culinary Techniques:** Training in fundamental cooking techniques, such as boiling, grilling, frying, baking, and sautéing, ensures that all staff can prepare a variety of dishes.

- **Advanced Cooking Methods:** For more experienced staff, training in advanced techniques such as sous vide, molecular gastronomy, or specific ethnic cuisines can enhance the variety and quality of meals.

- **Menu Planning and Meal Preparation:** Courses on menu planning help staff create balanced, nutritious, and appealing meals, while training in meal preparation focuses on efficient time management and multitasking in the galley.

- **Dietary Restrictions and Special Diets:** Training on how to accommodate special diets (e.g., vegetarian, vegan, gluten-free, and medical diets) ensures that the needs of all crew members are met.

- **Cultural Sensitivity in Food Preparation:** Given the diverse backgrounds of crew members, training in preparing culturally appropriate dishes can improve meal satisfaction and inclusivity.

2. Food Safety and Hygiene Training

- **Food Handling and Storage:** Training on proper food handling techniques, including maintaining the cold chain, avoiding cross-contamination, and proper food storage practices, is essential for preventing foodborne illnesses.

- **Personal Hygiene Standards:** Emphasizing the importance of personal hygiene, such as regular hand washing, wearing clean uniforms, and proper use of gloves and hairnets, helps maintain high hygiene standards in the galley.

- **Sanitation Practices:** Training on cleaning and sanitizing galley equipment, surfaces, and utensils ensures a clean and safe food preparation environment.

- Allergen Management: Staff should be trained in identifying and managing food allergens to prevent allergic reactions, including the importance of avoiding cross-contact between allergen-containing and allergen-free foods.

- Temperature Control: Instruction on maintaining proper cooking, holding, and storage temperatures to prevent bacterial growth and ensure food safety.

3. Maritime-Specific Training

- Galley Safety at Sea: Training on specific safety practices for working in a ship's galley, such as securing equipment during rough seas, safe handling of knives and other sharp tools, and fire prevention, is vital for reducing the risk of accidents.

- Waste Management and Environmental Practices: Staff should be trained in the correct disposal of food waste and packaging materials, adhering to maritime regulations for waste management, and minimizing the environmental impact of galley operations.

- Emergency Procedures: Training in emergency protocols, including what to do in case of a fire, spill, or other galley emergencies, is crucial for ensuring the safety of the crew and the ship.

4. Health and Nutrition Education

- Nutritional Awareness: Training programs that educate staff on the nutritional needs of the crew, including the importance of balanced diets, portion control, and the nutritional value of different ingredients, can help in preparing healthier meals.

- Hydration and Health Monitoring: Teaching staff to recognize signs of dehydration and nutritional deficiencies, and how to adjust menus to address these issues, ensures the well-being of the crew.

5. Regulatory Compliance Training

- Maritime Food Safety Regulations: Training on international and maritime-specific food safety regulations, such as those set by the International Maritime Organization (IMO) ILO (International for ships, ensures compliance and readiness for inspections.

- Hazard Analysis and Critical Control Points (HACCP): HACCP training is essential for identifying and managing potential food safety hazards in the galley, from procurement to serving.

6. Sustainable Practices and Resource Management

- Sustainable Sourcing and Waste Reduction: Training on sourcing sustainable ingredients, reducing food waste, and implementing eco-friendly practices in the galley contributes to the overall sustainability of the ship.

- Energy and Water Conservation: Teaching staff how to use energy and water efficiently, from cooking to cleaning, helps conserve resources and reduce the ship's environmental footprint.

7. Customer Service and Communication Skills

- Communication and Teamwork: Given the confined and often stressful environment of a ship's galley, training in effective communication and teamwork is essential for smooth operations and a positive work environment.

- Customer Service Training: While galley staff may not interact directly with passengers or crew frequently, understanding customer service principles, such as taking feedback and making adjustments to meals, can enhance meal satisfaction.

8. Certifications and Continuous Education

- Food Safety Certifications: Obtaining certifications such as ServSafe or equivalent maritime food safety qualifications ensures that staff are up-to-date on best practices and legal requirements.

- First Aid and CPR: While not directly related to culinary skills, basic first aid and CPR training are important for all crew members, including galley staff, to handle medical emergencies at sea.

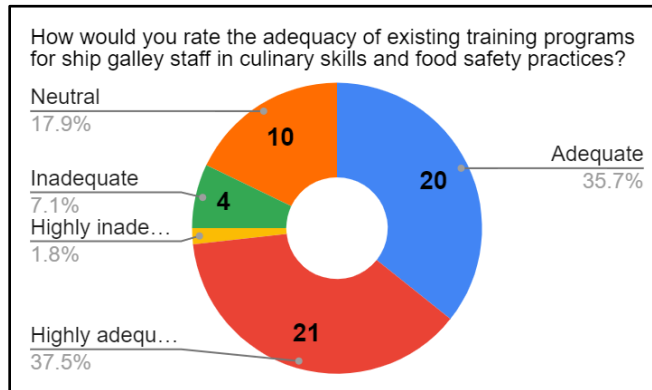
9. Cultural and Ethical Training

- Cultural Competency: Training that focuses on understanding the diverse cultural backgrounds of crew members and catering to their culinary preferences fosters a more inclusive dining experience.

- Ethical Sourcing and Fair Trade Awareness: Educating staff on the importance of ethical sourcing and supporting fair trade practices can help align the ship's operations with broader social responsibility goals.

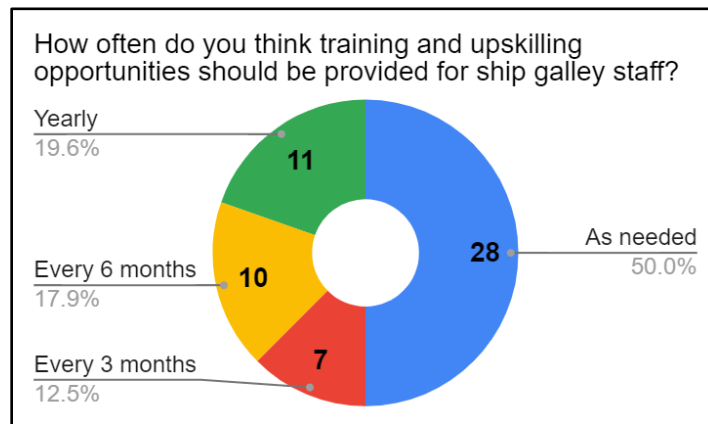
By implementing these training programs, galley staff will be well-equipped to manage the unique challenges of cooking at sea, ensuring food safety, maintaining high culinary standards, and contributing to the overall success of the voyage.

“How would you rate the adequacy of existing training programs for ship galley staff in culinary skills and food safety practices? (%)”



Most staff working in the galleys think training programs for culinary skills and food safety practices are adequate. Only five respondents think they are inadequate while 10 respondents do not have a firm idea. Culinary practice is a constantly evolving and changing process, both in terms of skill development and safety. In parallel with the developments in technology, there will inevitably be developments and changes in the practices in these areas. For this reason, it will be beneficial to refresh the knowledge of galley staff about the latest developments at certain intervals.

“How often do you think training and upskilling opportunities should be provided for ship galley staff? (%)”



Although most participants responded that training and upskilling are necessary as needed, Training programs for culinary skills and food safety practices should be provided regularly to ensure that galley staff stay updated with best practices, regulations, and evolving culinary trends. The frequency of these training programs can depend on several factors, such as the nature of the ship's operations, crew turnover, and changes in food safety regulations.

Regularly scheduled training ensures that galley staff maintain high standards of food safety and culinary skills, and it prepares them to adapt to changes in regulations, technology, and the specific needs of the ship.

In light of the information given above, the training that ship cooks should receive can be grouped under the following headings:

1. Initial Training

- Upon Hiring: All new galley staff should undergo comprehensive initial training before they start working. This should cover essential culinary skills, food safety practices, personal hygiene, and specific maritime regulations.

2. Annual Refresher Courses

- Food Safety and Hygiene: Annual refresher courses on food safety and hygiene practices should be mandatory. This ensures that staff remain compliant with current regulations and are reminded of best practices.

- Culinary Skills: An annual review of culinary skills helps keep staff updated on new techniques, trends, and menu planning. This can also include specialized training based on the changing needs of the crew or passengers.

3. Regulatory Updates and Compliance

- As Needed: Whenever there are updates to food safety regulations, maritime laws, or industry standards (e.g., changes in HACCP protocols), galley staff should be trained promptly to ensure compliance. This may require training sessions multiple times a year, depending on the frequency of regulatory changes.

4. On-the-Job Training and Continuous Learning

- **Monthly/Quarterly Sessions**: Regular, shorter training sessions can be conducted monthly or quarterly to address specific areas, such as new recipes, sustainability practices, or equipment handling. These sessions can also serve as a platform for addressing any issues observed in day-to-day operations.

- On-the-Job Coaching: Continuous, informal on-the-job training should be encouraged, where senior staff or supervisors coach junior staff on improving their skills or addressing specific challenges as they arise.

5. After Significant Events

- **Post-Incident Training:** If a food safety incident occurs, such as a contamination event or foodborne illness outbreak, immediate retraining should be provided to address the root cause and prevent future occurrences.

- **After Inspections:** If an inspection reveals areas for improvement, targeted training should be provided soon after to correct any deficiencies.

6. Crew Turnover and Contract Renewals

- **For New Contracts:** When a new crew contract begins, or when a staff member renews their contract, a review or refresher training session should be provided, even if they have undergone previous training. This ensures consistency and adherence to updated practices.

- **High Turnover Periods:** In cases of high staff turnover, training should be more frequent to ensure that all new staff are properly trained and integrated into the team.

7. Specialized Training

- **Seasonal or Special Menu Changes:** If there are changes in the menu, such as during holidays, new voyages, or catering to special dietary needs, specialized training sessions should be scheduled as needed.

- **New Equipment Training:** Whenever new galley equipment is introduced, staff should be trained on its proper use, maintenance, and safety features.

8. Periodic Certification Renewal

- **Every 2-3 Years:** Many food safety certifications, such as ServSafe or equivalent maritime-specific certifications, require renewal every 2-3 years. Galley staff should undergo the necessary training and exams to renew these certifications within the required timeframe.

9. Sustainability and Environmental Practices

- **Biannual or Annual Updates:** As sustainability practices and technologies evolve, biannual or annual training on sustainable sourcing, waste reduction, and resource management should be provided to keep the galley operations aligned with current environmental standards.

Summary

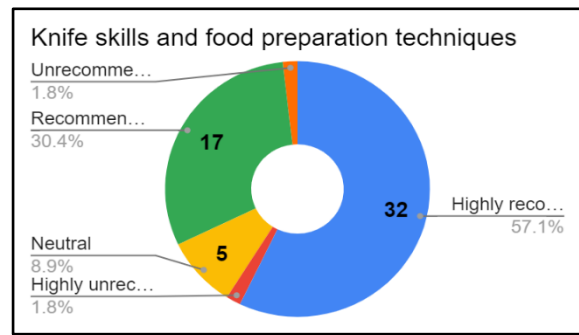
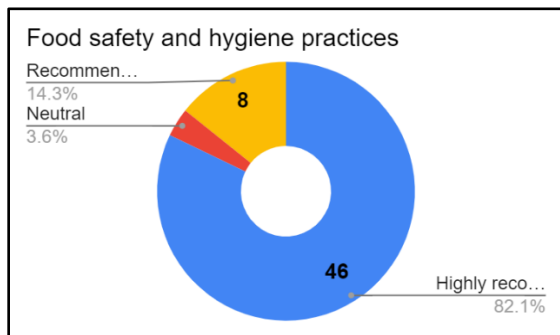
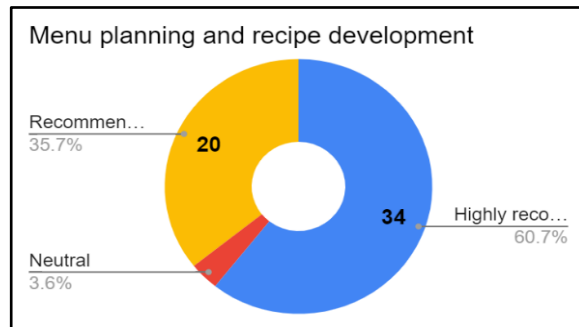
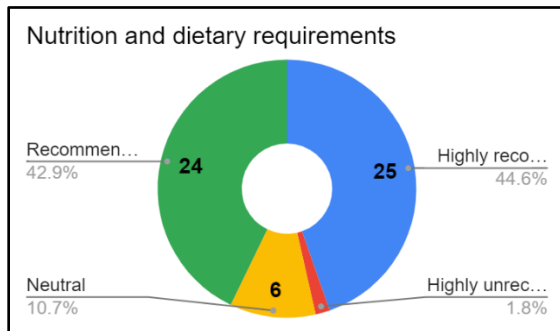
- **Initial Training:** Before starting work.

- **Annual Refresher Courses:** Food safety, hygiene, and culinary skills.

- **Regulatory Updates:** As needed based on changes in regulations.

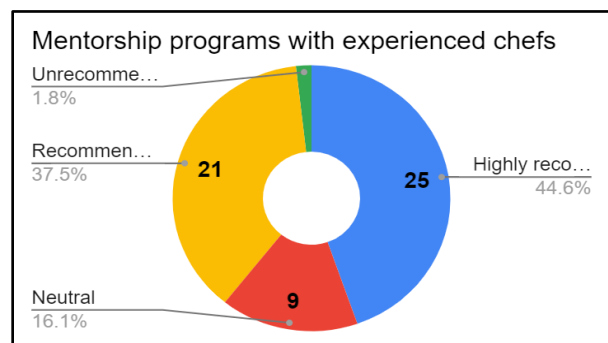
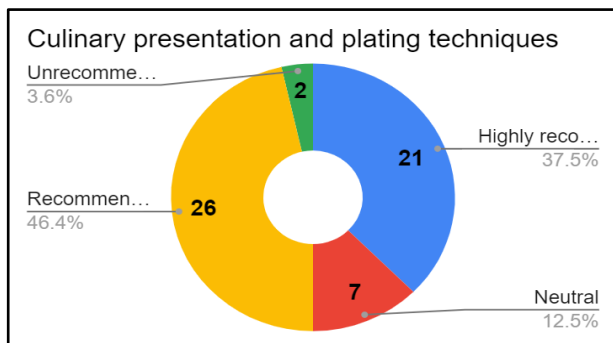
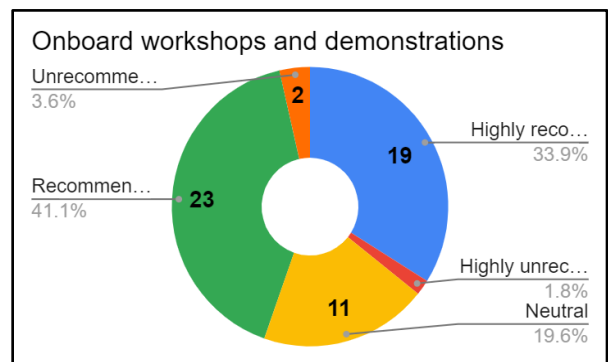
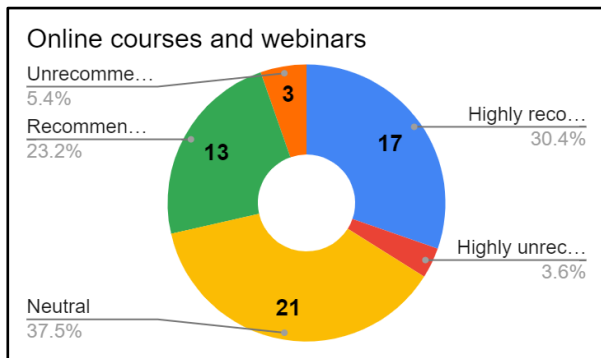
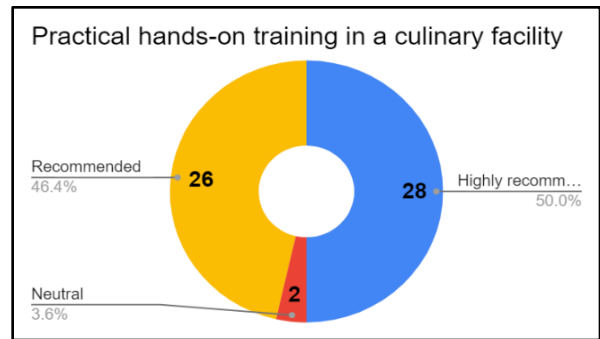
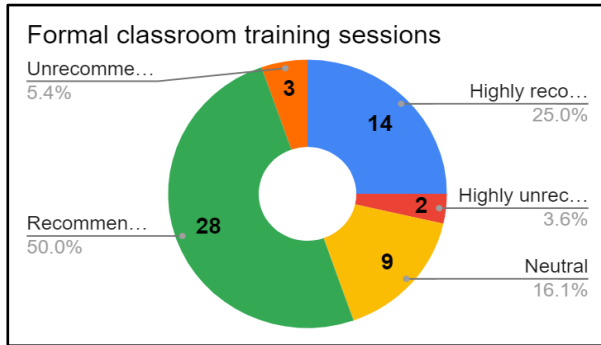
- Monthly/Quarterly Sessions: Focused training on specific areas.
- Post-Incident or Inspection: Immediate retraining after significant events.
- For New Contracts and High Turnover: Review and training for new or returning staff.
- Specialized Training: As needed for new equipment, menu changes, or sustainability practices.
- Certification Renewal: Every 2-3 years for required certifications.

“ Which of the following specific areas of culinary skills training should be prioritized for ship galley staff? (%)”



Since the respondents to this question are galley staff, it can be assumed that their answers reflect their own deficiencies or inadequacies. According to this, the staff thinks that they need training in all the fields covered by this question since all options were answered as “recommended” and “highly recommended” with over a rate of 80%. That means they need training and education on all of these topics. The scope of the training and education can be expanded to cover related fields to these options.

“Which of the following formats of training delivery would be most effective for ship galley staff? (%)”



The most popular training style is “Practical hands-on training in a culinary facility” followed by “Mentorship programs with experienced chefs”, while the least preferred one is online courses and webinars. All other methods are applicable and variations are necessary to make the learning richer so, in conclusion, it can be said that all methods can be used with an emphasis on the most preferred ones.

CHALLENGES

Galley staff on ships face numerous challenges when it comes to providing healthy and nutritious meals. These challenges are often amplified due to the unique environment of maritime operations. The following list gives the challenges they face in detail:

1. Limited Storage Space:

- Space Constraints: Ships have limited storage space for food, especially fresh produce, which can restrict the variety of ingredients available. Galley staff must be creative in meal planning and often rely on preserved or canned goods.

- Shelf Life: Fresh food has a limited shelf life, and managing the inventory to prevent spoilage while ensuring a steady supply of nutritious ingredients can be challenging.

2. Supply Chain and Logistics Issues:

- Inconsistent Resupply: Depending on the ship's route and schedule, resupplying fresh ingredients can be inconsistent or delayed. This requires careful planning and sometimes forces the use of less healthy alternatives.

- Quality of Supplies: The quality of food provisions can vary depending on the ports where the ship resupplies. Galley staff may have to work with ingredients that are not always of the best quality or nutritional value.

3. Dietary Restrictions and Preferences:

- Cultural and Religious Requirements: On multinational crews, galley staff must cater to diverse dietary needs, including religious and cultural preferences, which adds complexity to meal planning.

- Special Diets: Accommodating specific dietary restrictions, such as allergies, vegetarianism, or medical conditions, can be difficult with limited resources and supplies.

4. Nutritional Balance:

- Caloric Requirements: Crew members often have physically demanding jobs, requiring higher caloric intake. Balancing the need for energy-dense foods with nutritional quality is a key challenge.

- Variety: Ensuring a varied diet that provides all essential nutrients can be tough when working with limited ingredients, leading to potential nutritional deficiencies if not carefully managed.

5. Health and Hygiene Standards:

- **Food Safety:** Maintaining strict hygiene and food safety standards in a confined space is critical to preventing foodborne illnesses. This can be difficult in rough seas, where stability and clean conditions are harder to maintain.

- **Pest Control:** Ensuring that food supplies are protected from pests, especially on longer voyages, requires constant vigilance and proper storage practices.

6. Budget Constraints:

- **Cost Management:** Galley staff often have to work within a strict budget, which can limit the quality and variety of ingredients they can purchase. Balancing cost with nutritional value is a significant challenge.

- **Waste Reduction:** Reducing food waste while ensuring that meals are both nutritious and satisfying requires careful planning and portion control.

7. Crew Morale and Expectations:

- **Repetition:** On long voyages, the crew can become bored with repetitive meals, leading to dissatisfaction. Galley staff must be creative in using the same ingredients in different ways to keep meals interesting.

- **High Expectations:** The crew may have high expectations for meals, especially during challenging conditions. Meeting these expectations with limited resources can be stressful for galley staff.

8. Time and Labor Constraints:

- **Limited Personnel:** The galley staff on ships are usually small teams that must prepare meals for the entire crew multiple times a day. Time constraints and high workloads can make it challenging to focus on preparing healthy, balanced meals.

- **Shift Work:** Crew members work in shifts, requiring galley staff to provide meals at irregular hours. This can complicate meal planning and preparation, especially for ensuring that all meals are nutritious.

9. Adverse Weather Conditions:

- **Rough Seas:** Preparing meals in rough seas can be dangerous and challenging. Ensuring that meals are still of good quality and nutritious under such conditions is an additional burden on the galley staff.

- **Energy Management:** The energy and resources needed to prepare meals can be affected by the ship's operational conditions, such as power limitations, which can restrict cooking methods and time.

10. Mental and Physical Fatigue:

- Long Hours: The demanding nature of galley work, coupled with long hours and sometimes harsh conditions, can lead to physical and mental fatigue. This can affect the quality of food preparation and the ability to consistently provide healthy meals.

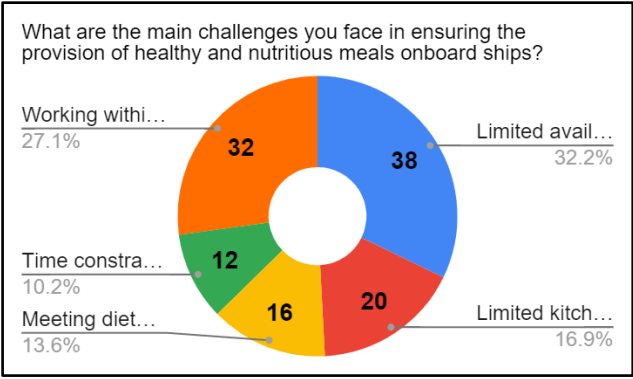
- Stress Management: Balancing all these challenges while maintaining a positive attitude and morale can be difficult for galley staff, impacting their performance.

Considering the information above, it can be concluded that galley staff on ships must navigate a complex array of challenges, from logistical constraints to dietary needs and environmental conditions, all while ensuring that the crew receives healthy and nutritious meals. Their role is crucial in maintaining the well-being and efficiency of the crew, despite these obstacles.

“What are the main challenges you face in ensuring the provision of healthy and nutritious meals onboard ships? (%)”

	%
Limited availability of fresh ingredients	32,7
Time constraints for meal preparation	10,2
Working within budget constraints	27,1
Limited galley equipment and facilities	16,9
Other (Specify)	----

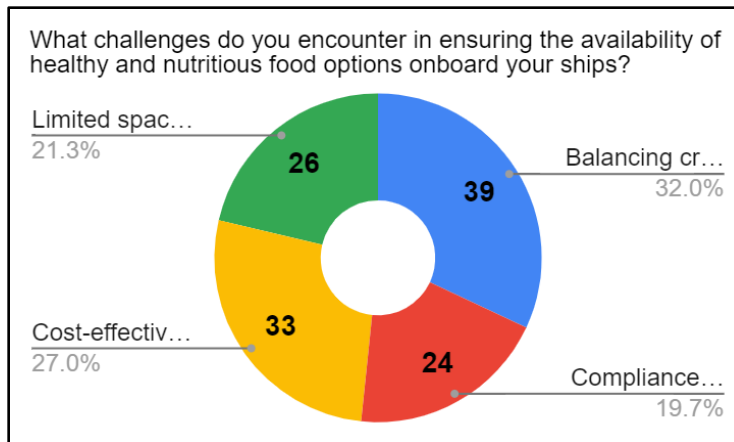
Of the challenges given above, the one the galley staff suffers the most seems to be limited availability or fresh ingredients, followed by working within budget constraints. The problems with galley equipment are not considered as significant as the ones related to fresh ingredients and budget constraints. There are some problems with time constraints with meal preparation but they are not considered as important as the others. So it is concluded that the problems that the galley staff have fresh ingredients are the ones that should be solved as soon as possible.



“What challenges do you encounter in ensuring the availability of healthy and nutritious food options onboard your ships? (Select all that apply) (%)”

	%
Balancing crew preferences with nutritional needs	32
Cost-effectiveness of sourcing quality ingredients	27
Limited space for storage and preparation	23,1
Compliance with regulations and standards	19,7
Other (please specify)	

The responses given to this question prove that galley staff try to prepare a menu that can both meet the needs of good nutrition requirements and the demands of the crew. We understand there are discrepancies between the two aims which makes it hard to provide the balance between them. They consider this an important problem. The second challenge for them is the cost-effectiveness of sourcing quality ingredients, followed by limited space for storage and preparation. They also suffer from problems arising from compliance with regulations and standards. **Taking all these into consideration, a program teaching the respondents how to cope with such hardships through various methods can be designed as well as finding ways to solve them.**



Seably [19], a learning platform for seafarers gives the following recommendations on Smart Provisioning.

When taking provisions, think about what you need. Some ships cannot take provisions regularly and are not always in suitable ports. The cook must adapt to the circumstances and stock up. Don't order things you already have in abundance. Keep all stores tidy and easy to inspect, so you don't overstock.

Ordering

Don't order more than you will use. Calculate how much you use in the next period. If there are 15 members of the crew, you need about 6 kg of protein every day (meat, chicken, fish) in total for lunch and dinner. In 6 weeks it is 6 kg x 42 days = 252 kg (400 g/person/day). Breakfast is not included. Don't order more spices than you need. Just order small packs, 50-100 g. Then you will have fresh spices in stock. Calculate how much you use in 4-6 weeks. Order flour, sugar, and salt in smaller packs, 1-2 kg. That makes it easier to keep the dry store fresh and prevents flour bugs. Don't copy the previous provision list and order the same amount. Reduce or cancel the items you don't need.

Thawing and Freezing

Don't unfreeze and freeze the same items many times. If you get a big block of, for instance, minced meat, unfreeze as little as possible, divide it into smaller pieces (1-2 kg), and freeze it in small plastic bags. Do the same with all kinds of "block frozen" products.

Meal Planning

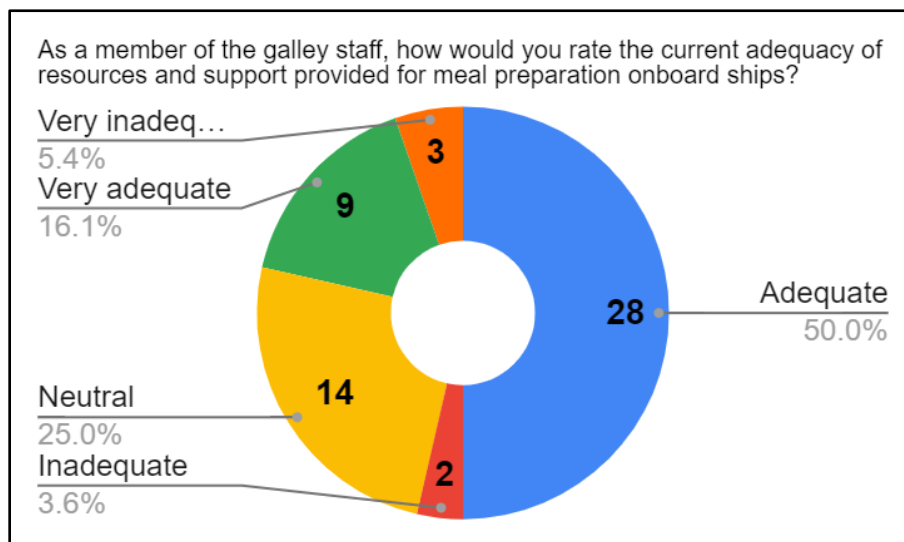
Planning what you will serve for lunch and dinner one week ahead, will make it easier to work. Take out items from the freezer 2-3 days ahead, and thaw them out in the fridge. Alternate between Asian and European food.

Making a nice and colorful salad buffet every day makes the meal more enjoyable and healthier. When making the salad buffet, use several different colors so you get a nice variety [20].

“How would you rate the current adequacy of resources and support provided for meal preparation onboard ships? (%)”

Very Inadequate	Inadequate	Neutral	Adequate	Highly adequate
5,4	3,6	25	50	16,1

Concerning the adequacy of resources and support, %66,1 of the galley staff who participated in the survey think that they have adequate or highly adequate resources and support in the galley. However, %34 of them do not agree with this idea. This result signals that there are some problems to be solved to make the meal preparation



It shows that some measures need to be taken to improve cooking for galley staff. As a result, some support is needed to ensure that the ship's galley has sufficient quantities of healthy, nutritious ingredients that are pleasing to the eye and stomach. Some workers, the majority, found the conditions and materials adequate, while others emphasized that there is room for improvement. It might be advisable to revisit the conditions and improve the aspects that have been criticized.

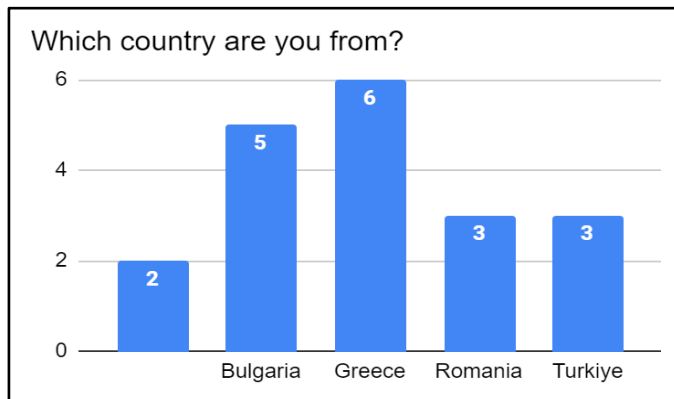
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ANALYSIS OF THE SURVEY FOR EMPLOYERS

DEMOGRAPHIC QUESTIONS

This survey was designed and applied to see the attitude of the employers in the maritime sector toward the issues concerning the scope of the CUL-MAR-Skills Project. The survey covers 15 questions that can be grouped under the following titles: Proper Nutrition and Well-Being, Sustainability, Hygiene, Training and Education, and Challenges.



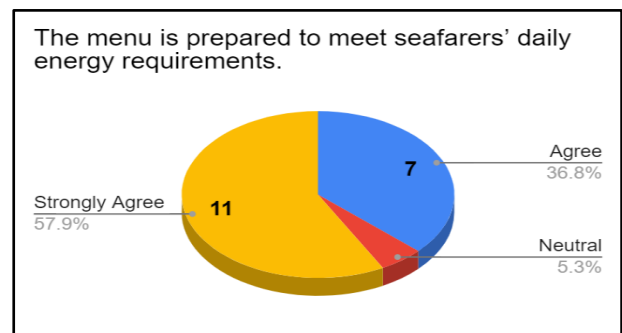
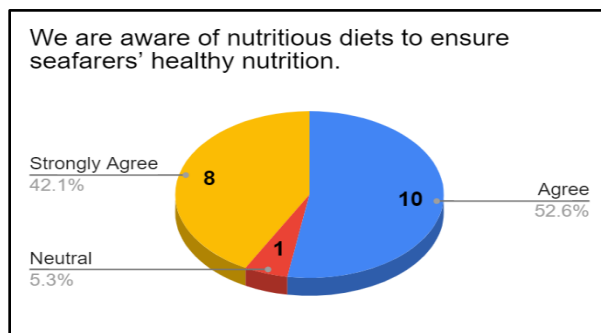
The survey was responded to by 19 employers from 4 countries. Although the number of participants is not high enough to form a generalization of the survey results to the whole employers they can provide a significant insight into their attitudes toward the employers on the general situation. The figure on the left shows the distribution of the

participants according to the countries. Six employers from Greece and 5 from Bulgaria participated in the survey. 3 employers from Romania and Turkiye each responded to the questions while 2 of the participants did not indicate their nationalities.

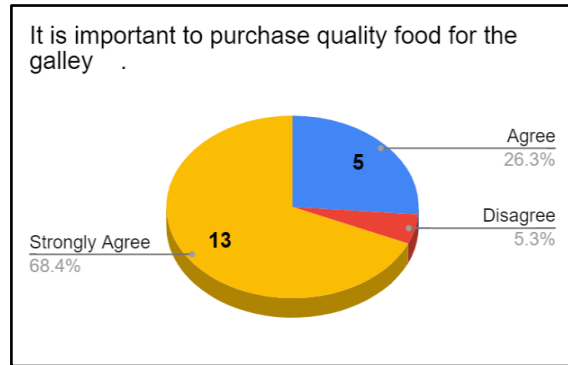
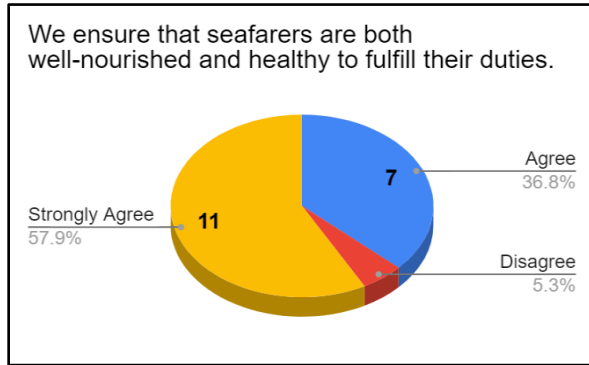
PROPER NUTRITION and WELL-BEING

In the frame of this section, three questions were asked. The first question is about the cooking practices onboard. It covers 12 sub-questions. The table and the figure reflecting the responses of the participants are given below.

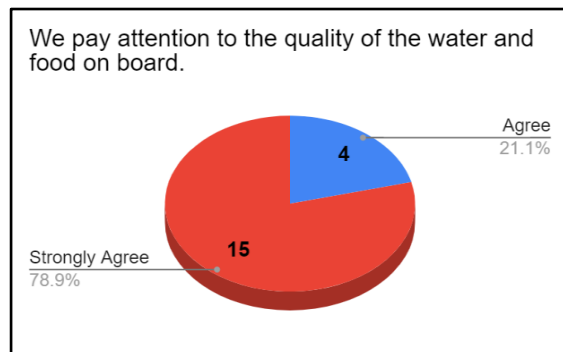
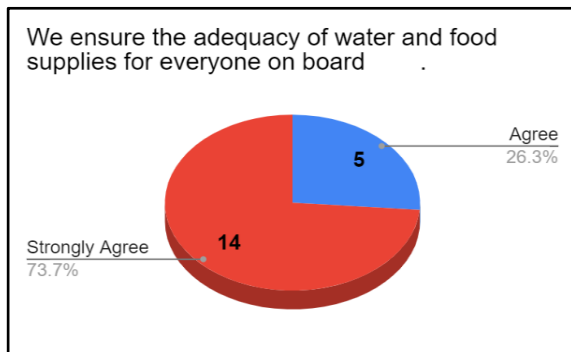
“Please specify how much you agree with the following statements regarding cooking practices. (%)”



The responses to the questions in this part show that the employers know the importance of nutrition for seafarers. All of them but one agreed or strongly agreed with the statements that they were aware that nutritious diets are crucial for seafarers' health and that the menu is prepared to meet the seafarers' energy needs.

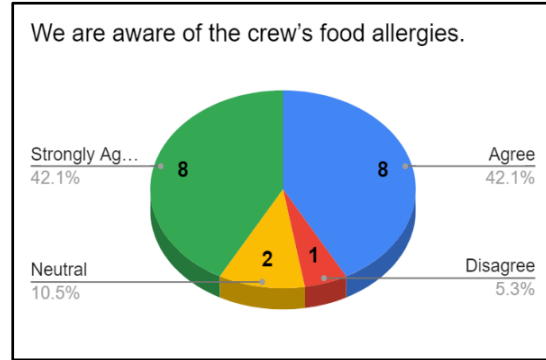
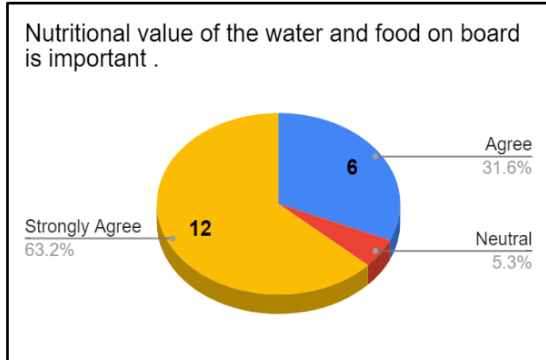


Over and above these, they want to ensure seafarers are well-nourished with good quality food. They know how important it is to provide them with an adequate amount of water and food with high nutritional value, as the figures below show.



The nutritional value of the food is found important by 94,8 % of the respondents. That means the quality of the food is as important as its quantity and they know good food is the key to the motivation, success, and productive work of the crew. They sometimes offer a good menu as a motivational tool. *Nutrifusion* says “If you want to maintain and increase your level of motivation, you should start with nutrition”. Without a healthy diet, people will have a hard time putting other motivation tips into practice. People require a certain amount of energy to deal with their everyday routine tasks and their energy levels can be increased by following the principles of good food. Good food gives us energy, water, useful substances, and minerals, which have a positive effect on physical and mental health.

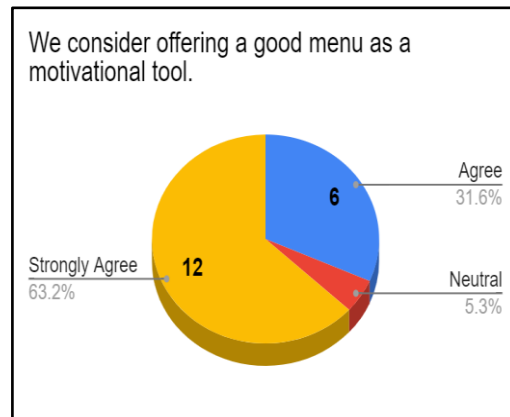
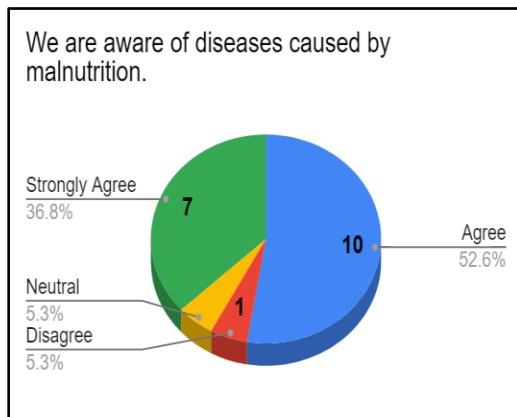
It can be concluded that nutrition has a lot to do with how motivated people feel. If they want to maintain and increase their level of motivation, you should start with nutrition. Without a healthy diet, they will have a hard time putting other motivation tips into practice [1].



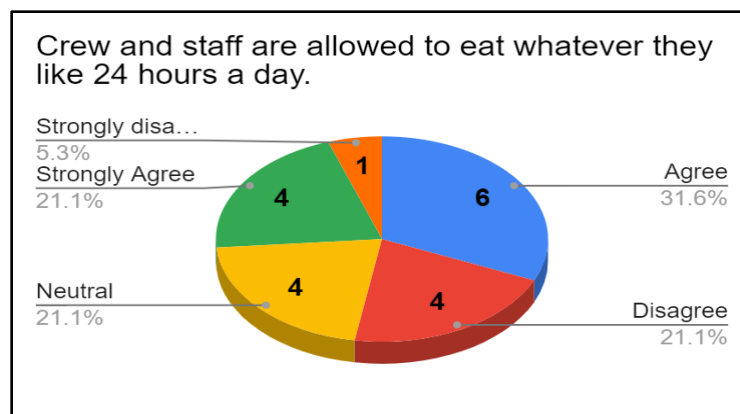
Another important issue is to make sure that the food the crew eats will not cause allergic reactions. 15,8% of the employers said they did not know about the food allergies of the crew. This is an important issue since some allergic reactions can be too strong and it is not always possible to find an effective cure or a doctor onboard.

ITF Seafarers state that

- Healthy eating helps to protect against malnutrition and non-communicable diseases (NCDs), such as diabetes, heart disease, stroke, and cancer.
- Unhealthy eating and lack of physical activity are leading global risks to health.
- Switching to healthy eating does not have to mean all or nothing. You do not have to eliminate the foods you enjoy or change everything all at once. Just make a few small changes at a time [2].



The survey results show %89,4 of the employers are aware of the diseases caused by malnutrition%94.8 of them consider offering a good menu as a motivational tool.



%52,7 of the employers say the seafarers can eat whatever they like while onboard. %26,4 of them do not agree with this idea. %21,1 do not have an idea. Eating whatever they like while on board may not be a good idea for the seafarers because unconscious eating is one of the causes of malnutrition. Oldenburg et. al. (2013) says seafarers have limited influence on the quality and quantity of food over several months. Furthermore, the nutrition on board is characterized by different dietary habits in the multi-ethnic crews, differential food supply in the crew's and officers' mess room, and irregular mealtimes due to the shifts on board. Internationally, the nutritional situation on board is not standardized but reflects the flag-state standard [3].

They say seafarers do not have the liberty to eat whatever they like. In their study, they state that Seafarers have very limited influence on the quality and quantity of food over several months, especially during sea voyages on board worldwide cruising merchant vessels. In the current seafaring situation, warm meals are usually served 3 times a day. The following list summarizes the actual dietary and living conditions on merchant ships:

- lack of self-determination in the selection of food;
- different dietary habits in multi-ethnic crews;
- differential food supply in crew's and officers' mess rooms;
- irregular mealtimes due to the shifts on board;
- limited opportunities for physical activities in leisure time;
- exceptionally high level of psychosocial stress in seafaring occupation

When the answers given to the questions in this group are considered, it is seen that the employers in the maritime sector are sufficiently knowledgeable and interested in the diet and needs on board. Employers who have sufficient knowledge about the reasons why seafarers should be well-nourished and the positive effects of good nutrition on health, motivation, and work efficiency are making efforts to ensure good nutrition. It can be said that one point to be considered here is the individual nutritional characteristics and problems of seafarers such as allergies.

One question to which employers did not predominantly give the same answer was the freedom of seafarers to eat the food they want whenever they want. There may be different reasons for this. For example, if it is a question of eating by entering the galley, it is not an appropriate course of action in terms of hygiene for anyone to enter the galley at any time and eat what they want. In addition, there may have been a restriction on seafarers' eating hours to prevent various health problems that may be caused by uncontrolled nutrition. As a result, it should not be considered as a negative situation that employees cannot eat whatever they want whenever they want. The opposite may also be the case. Eating whatever you want whenever you want may not be a positive attitude. Therefore, both seafarers and employers should be informed about the requirements of healthy nutrition.

“Please specify how much you agree with the following statements regarding equity and diversion. (%)”

The next question in this section concerns the importance of equity and diversion in the galley. These are important topics because ships, especially those that carry international crews or passengers, often have people from diverse cultural backgrounds. Offering meals from different nations ensures everyone access to familiar and culturally appropriate food. This can make people feel more comfortable and valued. This is crucial for cultural inclusivity.

In addition, a variety of meals can help improve the morale and well-being of the crew. Working at sea can be stressful and isolating, and providing familiar foods can offer comfort and a connection to home.

On the other hand, considering the nutrition and dietary preferences of the crew boosts their morale since Different cultures have distinct dietary habits, and offering a variety of meals ensures that everyone's nutritional needs and preferences are met. For example, some cultures have specific dietary restrictions or preferences, such as vegetarianism, halal, or kosher meals.

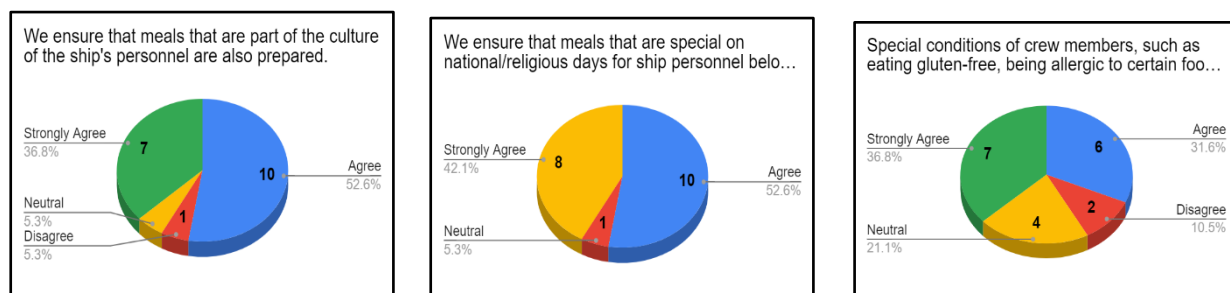
Cooking meals from different nations allows the ship's culinary staff to diversify their skills and learn new recipes. This can be a source of professional growth and creativity for the chefs onboard. Thus they can enhance their culinary skills. On cruise ships or passenger vessels, offering a wide range of

international cuisine can enhance the overall experience. Passengers often expect a diverse menu that reflects the global nature of their journey, making it an essential part of the service.

Another advantage posed by emphasizing equity and diversion in the galley is that it promotes unity and teamwork because sharing meals from different cultures can promote understanding and unity among the crew. Food is a universal language, and experiencing different cuisines together can build camaraderie and mutual respect. On the other hand, variety is good. Eating the same type of food repeatedly can lead to "food fatigue." Introducing meals from different cultures can break the monotony and keep meals exciting and enjoyable.

In summary, cooking meals from different nations onboard ships is beneficial for fostering cultural inclusivity, improving morale, meeting diverse dietary needs, enhancing the culinary experience, and promoting unity among the crew and passengers.

This subsection of the survey has three questions. The responses given by employers to these questions reflect their opinions on the topic. The first question asks if they ensure that meals that are part of the culture of the ship's personnel are also prepared.



The responses show that the majority of the employers agree or strongly agree with the fact that meals representing the culture of the seafarers should be included in the menu.

The second question in this section is complementary to the first one since it asks if the employers ensure that meals that are special on national/religious days for ship personnel belonging to different nationalities are prepared on these days. **The responses to this question prove that they are conscious of the culturally important days or events for the seafarers and they tend to prepare the menu to celebrate them.**

The third question asks if the special conditions of crew members regarding food are taken into consideration. **It is seen that %68,4 of the employers consider these conditions while %31,6 do not care about this. However, this is a crucial issue since is directly related to the health of the seafarers.**

Employers take about the meals that are appropriate to the seafarers' culture to be prepared and menus that celebrate their special days and holidays are created. However, they do not show the same high level of sensitivity when it comes to considering the impact of meals on individual health. Accordingly, it is important to identify in advance if any dishes may adversely affect seafarers' health and to ensure that such dishes are removed from the menu as far as possible or not served to people with allergies. Of course, some employers pay attention to this issue, but it is useful to scrutinize the issue to ensure that positive behavior is adopted by more people.

This is a crucial issue since ignoring food allergies can lead to severe or even life-threatening reactions, such as anaphylaxis. Ensuring that crew members with allergies avoid certain foods is a basic safety requirement. Conditions like celiac disease (which requires a gluten-free diet) can cause significant health issues if not properly managed. Providing the right food helps prevent illness and ensures that crew members remain fit for duty.

Ensuring that crew members can eat food that meets their dietary preferences or restrictions can reduce stress and anxiety. This contributes to their overall morale and mental health. It can even boost job satisfaction and morale, leading to higher retention rates.

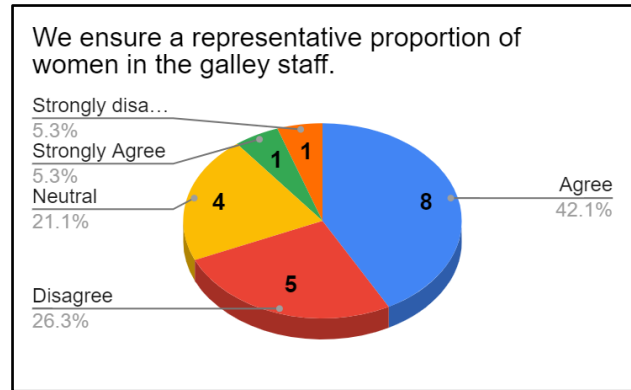
On the other hand, respecting dietary restrictions and preferences, whether due to health reasons, ethical beliefs (such as vegetarianism), or religious practices, fosters an inclusive environment. This shows that the ship's leadership values and respects the diversity of its crew.

In summary, considering the special dietary conditions of crew members is essential for maintaining their health, safety, well-being, and morale. It also demonstrates respect for individual needs and promotes a positive, inclusive, and efficient work environment.

The next question in this section is directly related to diversity regarding gender since women are still in the initial stages of getting jobs onboard and there is still some prejudice regarding women onboard. Having a representative proportion of women in the galley staff onboard ships is wise for several reasons: Firstly, a diverse team, including women, brings different perspectives, ideas, and approaches to problem-solving and creativity. This can lead to more innovative and well-rounded meal planning and execution.

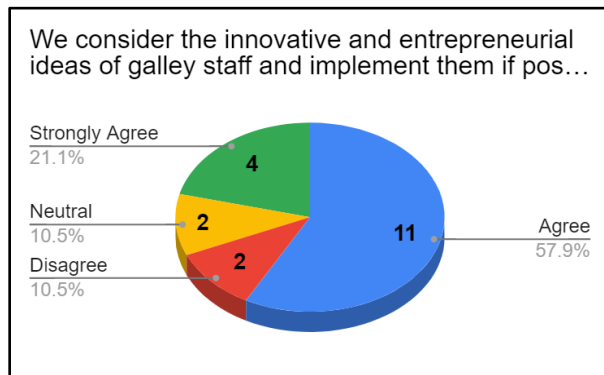
Promoting a balanced gender representation in traditionally male-dominated environments, such as the maritime industry, is an important step toward achieving gender equality and breaking down stereotypes about certain roles being "male" or "female."

Gender-diverse teams often exhibit better collaboration and communication. Having women in the galley staff can foster a more cooperative and respectful working environment. By including women in the galley staff, the ship taps into a broader talent pool. This ensures that the most skilled and qualified individuals are hired, regardless of gender. Women in leadership roles within the galley can serve as role models, encouraging more women to pursue careers in the maritime industry and culinary arts. , having a representative proportion of women in the galley staff is not only wise but beneficial for diversity, inclusion, and overall team dynamics. It supports gender equality, fosters a positive workplace culture, and ensures the best talent is utilized, ultimately enhancing the efficiency and morale of the crew.



The results show that employers do not fully support the existence of women in the galley to a certain degree. Less than half of them that is %47,4 of them agreed with this idea while %31,6 disagreed. % 21,1 of the employers did not have any idea.

The last question in this part asked if the employers considered the innovative and entrepreneurial ideas of galley staff and implemented them if possible. The innovative and entrepreneurial ideas of the galley staff are valuable for several important reasons. Innovative ideas from the galley staff can lead to more efficient food preparation, storage, and waste management processes. For example, implementing new cooking techniques or optimizing ingredient usage can save time and reduce costs. They are also important regarding resource management. Entrepreneurial thinking often includes finding ways to maximize resources, such as using surplus ingredients creatively or reducing food waste. This can significantly cut costs and improve the ship's overall operational efficiency. These ideas also help the creation of unique menus Galley staff who think innovatively can create more varied and exciting menus. This can greatly enhance the dining experience for both crew members and passengers, making meals more enjoyable and satisfying.



Being innovative helps with problem-solving and flexibility. Working at sea often involves unique challenges, such as limited ingredients or unpredictable weather conditions that affect food supplies. Innovative galley staff can quickly adapt to these situations by coming up with creative solutions, ensuring that high-quality meals are still provided

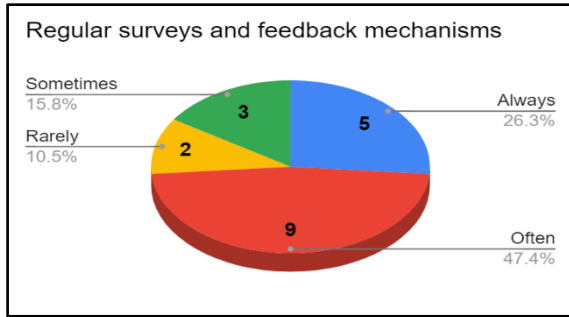
despite constraints. Entrepreneurial ideas encourage flexibility in the galley, allowing the staff to quickly pivot and adapt to changing circumstances, whether it's a sudden increase in demand or a supply chain disruption. Because of these reasons innovative and entrepreneurial ideas of the staff should be encouraged. **When the survey results were evaluated it was seen that %79 of the employers said they supported such ideas, strangely enough, %21 of them indicated they were against these ideas.**

All in all, it was seen that employers know the importance of including recipes belonging to different cultures in the menu onboard, They are also aware that the staff celebrating their special days should be served their special food. These are motivating for them. On the other hand, some steps should be taken by employers to ensure that seafarers can work effectively and efficiently. The first of these is to be aware of the problems of seafarers that require special diets and to take measures to prevent them from being negatively affected. Secondly, they should pay attention to the fact that some of the personnel working in the galley should be women. In this way, they will both provide diversity and bring the perspective of a different gender to the galley. Finally, employers need to value the innovative and entrepreneurial ideas of their galley staff and even encourage them to come up with such ideas. Employers need to be supported and informed on these three points.

“Please specify how you assess the overall satisfaction of crew members with the food services provided onboard your ships. (%)”

Measuring the satisfaction of crew members with the food services provided onboard ships is essential for maintaining high morale and overall well-being. Several methods can be used to assess their satisfaction effectively. For example, they can be given surveys and questionnaires to periodically gather honest feedback about the quality, variety, and overall satisfaction with the food services. Questions can cover aspects such as taste, portion size, meal variety, and special dietary accommodations. Regular Feedback Forms, which provide feedback forms after meals or every week can be another alternative. These can be short and focused on specific aspects like food quality, hygiene, and service. The survey has 3 questions in this part:

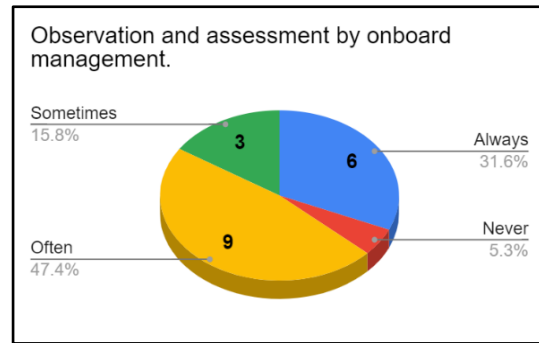
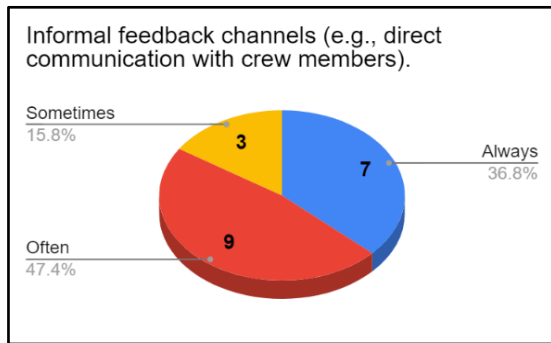
- a. Regular surveys and feedback mechanisms
- b. Informal feedback channels (e.g., direct communication with crew members)
- c. Observation and assessment by onboard management



The results show that regular surveys and feedback mechanisms are widely used by employers for this purpose. %73,7 of the participants expressed that they always or often used this method to gather feedback. %15,8 of the employers said they sometimes do surveys or get feedback to assess the overall satisfaction of crew members with the food services while %10,5 of them

said they never do so.

The next two options to see how satisfied the crew members were with the food served on board were using informal feedback channels like direct communication with crew members and observation and assessment by onboard management.



%36,6 of the employers said they always used informal feedback channels while %31,6 of them expressed they preferred observation and assessment by onboard management. The percentage of those who said they often used these methods was %47,4 both.

It is important to have feedback from the crew because the ship's management can identify areas for improvement, respond to crew needs, and ensure that food services contribute positively to overall crew morale and well-being if they know what to improve. To provide this the importance of getting feedback should be emphasized and some forms to be applied at certain intervals should be developed. So that those who are doing it can improve it, and those who are not doing it can start doing it.

SUSTAINABILITY

The questions in this section are intended to see the attitudes of employers toward sustainability. Before seeing the responses to the questions it may be good to have an idea of the ways employers in the maritime sector support sustainability in the galley board.

Employers in the maritime sector can support sustainability in the galleys onboard by implementing a variety of strategies focused on reducing waste, conserving resources, and promoting environmentally friendly practices. Here are several ways to achieve this:

1. Sourcing Sustainable Ingredients:

Local and Seasonal Ingredients: When in port, prioritize purchasing local and seasonal produce to reduce the carbon footprint associated with food transportation. This also supports local economies and ensures fresher ingredients.

Sustainable Seafood: Follow guidelines for sourcing sustainable seafood, such as those from the Marine Stewardship Council (MSC). This helps protect marine ecosystems and ensures that seafood is harvested in an environmentally responsible way.

Organic and Fair Trade Products Opt for organic and fair trade products, which are produced using sustainable farming practices and fair labor conditions.

2. Minimizing Food Waste

Efficient Meal Planning: Implement efficient meal planning and portion control to reduce food waste. This includes forecasting the right quantities of food to prepare based on crew numbers and preferences.

Repurposing Leftovers: Encourage the creative use of leftovers in subsequent meals. For example, turning unused ingredients into soups, salads, or other dishes can minimize waste.

Food Donation Programs: Where feasible, establish connections with local charities or food banks at ports to donate excess food that would otherwise go to waste.

3. Reducing Single-Use Plastics:

Eliminate Disposable Items: Reduce or eliminate single-use plastics, such as plastic cutlery, straws, and packaging. Instead, use reusable alternatives like metal cutlery, glass containers, and cloth napkins.

Eco-Friendly Packaging: For any necessary packaging, choose biodegradable or compostable materials. This reduces the environmental impact of waste generated onboard.

4. Energy-Efficient Practices:

Energy-Efficient Appliances: Equip galleys with energy-efficient appliances, such as ovens, refrigerators, and dishwashers that consume less power and water. Look for Energy Star-rated equipment or other certifications that indicate efficiency.

Smart Cooking Practices: Train galley staff in energy-saving cooking techniques, such as using residual heat, batch cooking, and reducing oven preheating times. This helps conserve energy during meal preparation.

5. Water Conservation:

Water-Saving Devices: Install water-saving devices, such as low-flow faucets and dishwashers, to reduce water consumption in the galley. This is particularly important on ships where water is a limited resource.

Efficient Dishwashing Practices: Encourage efficient dishwashing practices, such as washing only full loads in dishwashers and avoiding excessive rinsing.

6. Waste Management and Recycling:

Composting Organic Waste: Where feasible, implement composting systems for organic galley waste. This can reduce the amount of waste sent to landfills and create compost that can be used for shipboard gardens or given to local farmers at ports.

Recycling Programs: Establish comprehensive recycling programs for materials like glass, metal, cardboard, and plastics. Ensure that the crew is educated on how to properly separate and dispose of recyclables.

Waste-to-Energy Conversion: If the ship is equipped with waste-to-energy systems, organic waste can be converted into energy, reducing the ship's reliance on fossil fuels.

7. Promoting Plant-Based and Sustainable Diets:

Plant-Based Meals: Encourage the inclusion of more plant-based meals in the menu. Plant-based diets generally have a lower environmental impact compared to meat-heavy diets, reducing greenhouse gas emissions and resource consumption.

Meat Alternatives: Offer high-quality meat alternatives that are environmentally friendly and nutritionally balanced. This can help reduce the overall carbon footprint of the ship's food services.

8. Educating and Training the Crew:

Sustainability Training: Provide regular training sessions for galley staff on sustainability practices, including energy and water conservation, waste reduction, and sustainable sourcing. This helps ensure that sustainability is a core part of their daily operations.

Awareness Campaigns: Raise awareness among the entire crew about the importance of sustainability. Posters, workshops, and onboard campaigns can motivate everyone to participate in sustainable practices.

9. Monitoring and Reporting:

Sustainability Metrics: Track and report key sustainability metrics, such as food waste reduction, energy and water usage, and the sourcing of sustainable ingredients. Regular monitoring allows for continuous improvement and accountability.

Feedback Loops: Create feedback mechanisms where crew members can suggest improvements or share ideas for enhancing sustainability in the galley. This encourages a culture of continuous innovation.

10. Collaborating with Suppliers:

Sustainable Procurement Policies: Work with suppliers who prioritize sustainability in their operations. This includes choosing vendors who use environmentally friendly packaging, minimize their carbon footprint, and source responsibly.

Supplier Partnerships: Establish partnerships with suppliers who are willing to collaborate on sustainability initiatives, such as reducing packaging waste or providing sustainably sourced products.

11. Emphasizing Health and Well-being:

Balanced Menus: Create balanced menus that emphasize nutritious, whole foods. This not only promotes the health and well-being of the crew but also aligns with sustainable practices by reducing the reliance on processed foods.

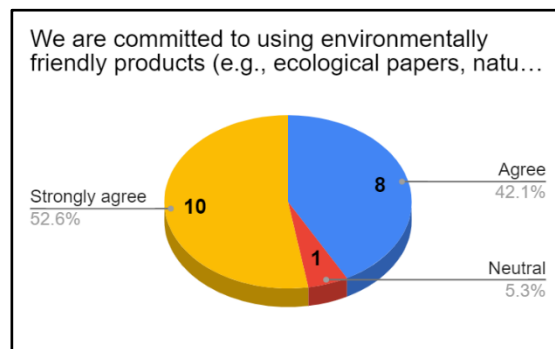
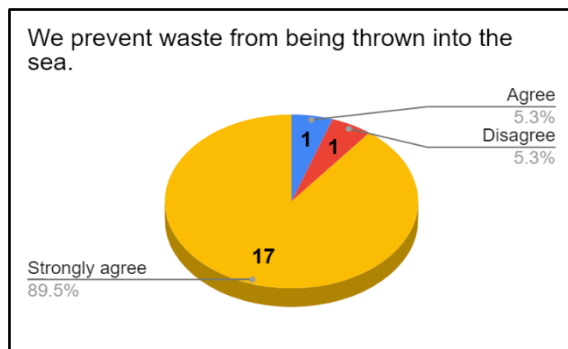
Mindful Consumption: Encourage mindful eating habits among the crew, promoting an understanding of the environmental impact of their food choices and reducing overconsumption.

In summary, supporting sustainability in the galleys onboard ships involves a holistic approach that includes sustainable sourcing, waste reduction, energy and water conservation, crew education, and collaboration with suppliers. By implementing these practices, maritime employers can significantly reduce the environmental impact of their food services and contribute to broader sustainability goals in the maritime industry.

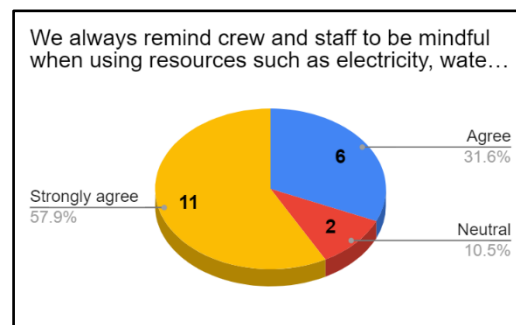
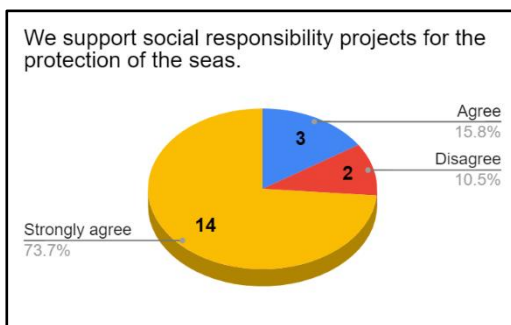
“Please specify how much you agree with the following statements regarding sustainability. (%)”

Employers were asked to specify how much they agree with the following statements regarding sustainability (%) The following statements about sustainability are listed in order starting with the statements that employers agree with the most. the results show that employers are very conscious about sustainability and that this awareness is reflected in their behavior.

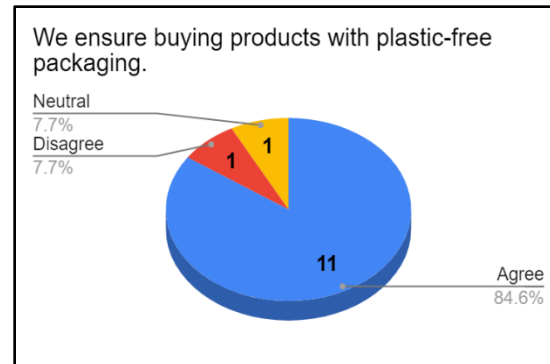
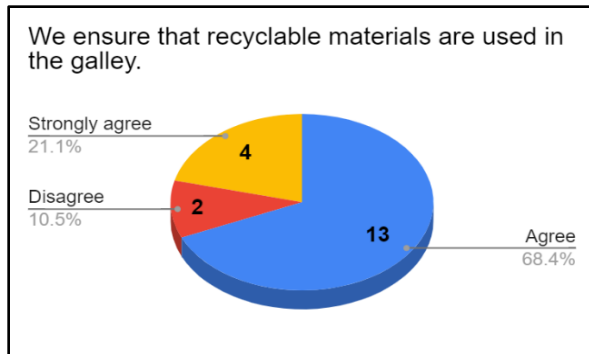
- We prevent waste from being thrown into the sea. %94,8
- We are committed to using environmentally friendly products (e.g., ecological papers, natural cleaning materials, organic foods) in the galley. %94,7



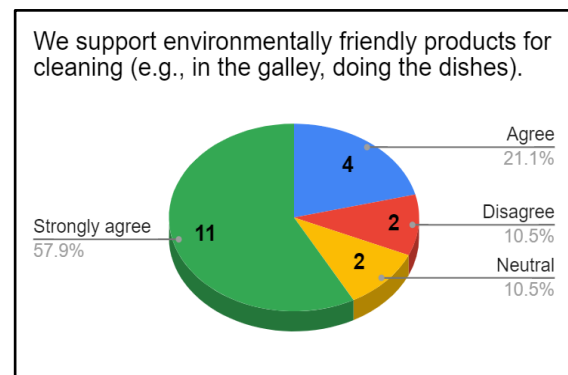
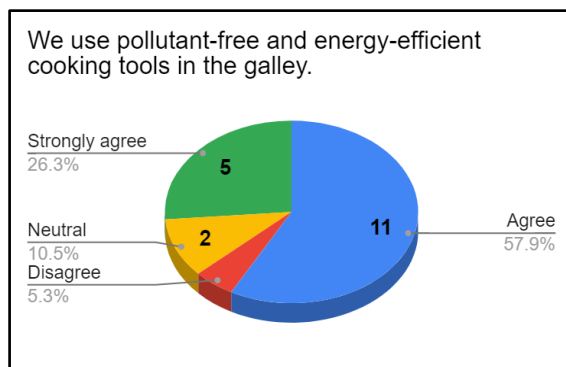
- We support social responsibility projects for the protection of the seas % 89,5
- We always remind crew and staff to be mindful when using resources such as electricity, water, etc. in the galley. % 89,5



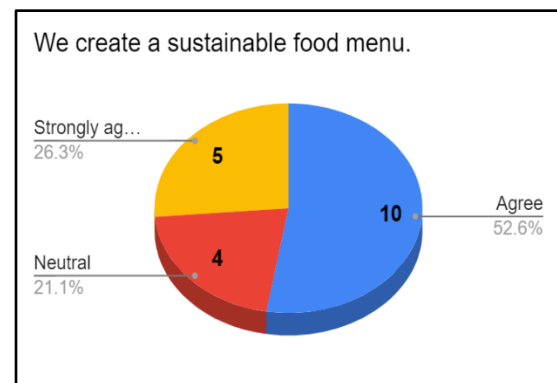
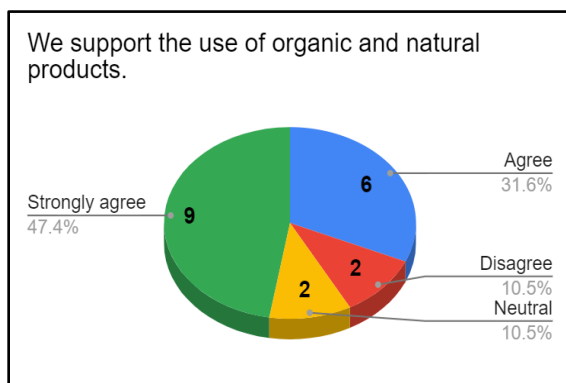
- We ensure that recyclable materials are used in the galley % 89,5
- We ensure buying products with plastic-free packaging % 84,6



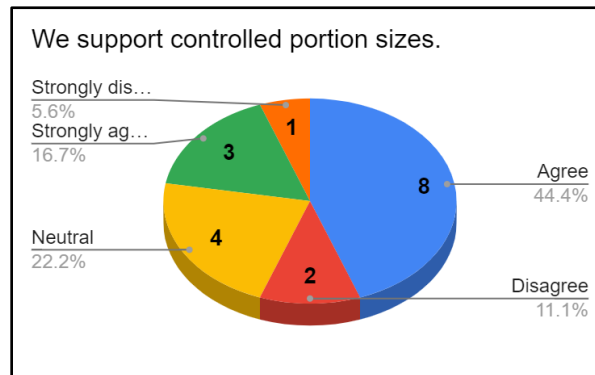
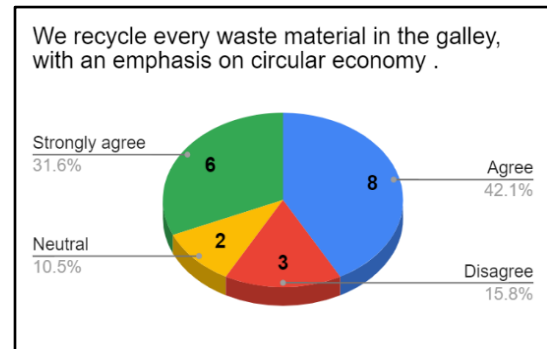
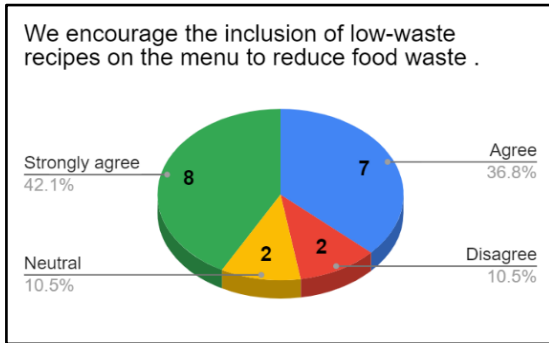
- We use pollutant-free and energy-efficient cooking tools in the galley % 84,2
- We support environmentally friendly products for cleaning (e.g., in the galley, doing the dishes) % 79



- We support the use of organic and natural products. % 79
- We create a sustainable food menu. % 78,9



- We encourage the inclusion of low-waste recipes on the menu to reduce food waste. % 78,9
- We recycle every waste material in the galley, with an emphasis on circular economy. % 73,7
- We support controlled portion sizes. % 61,1



The two issues with which employers least agree are recycling all waste materials in the galley, taking into account the requirements of the circular economy, and portion control. Portion control is necessary to prevent leftovers so that food will not be wasted. Being meticulous about recycling and ensuring that as much waste material as possible is recycled is necessary and important for sustainability. Employers can be informed about the importance of these issues and how they can be implemented.

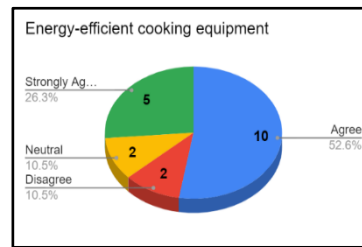
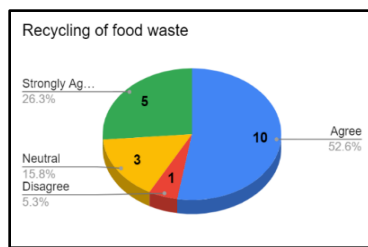
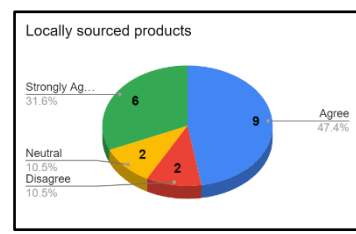
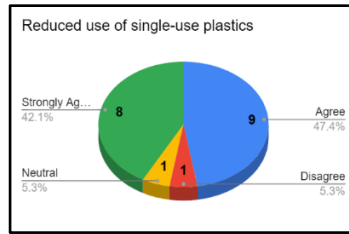
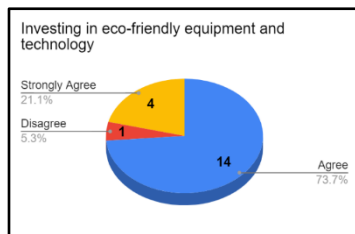
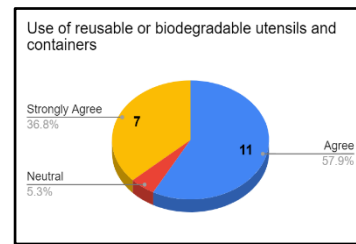
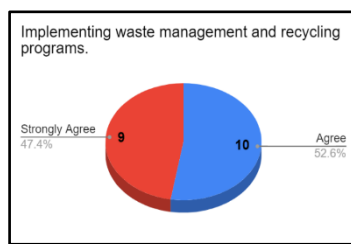
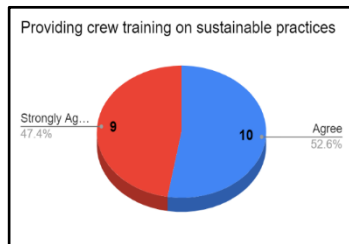
In the next part, employers were asked about the applicability of certain practices in the galleys regarding sustainability. The question they were asked was this:

“Do you agree that the following environmental practices could be implemented in the galley operations onboard ships? (%)”

This question consisted of six parts. The following statements are ranked based on the percentages of acceptance.

- | | % |
|---|------|
| 1. Providing crew training on sustainable practices | 100 |
| 2. Implementing waste management and recycling programs | 100 |
| 3. Use of reusable or biodegradable utensils and containers | 97,7 |

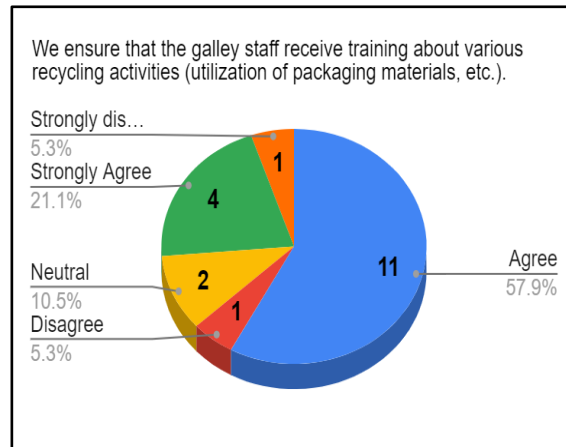
- | | |
|---|------|
| 4. Investing in eco-friendly equipment and technology | 94,8 |
| 5. Reduced use of single-use plastics | 89,5 |
| 6. Locally sourced products | 79 |
| 7. Recycling of food waste | 78,9 |
| 8. Energy-efficient cooking equipment | 78,9 |



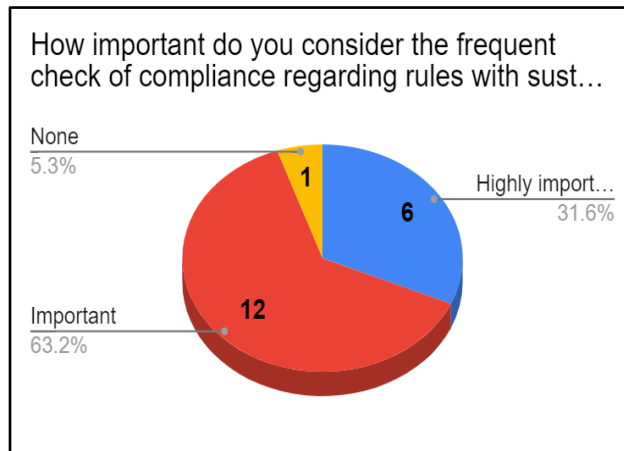
These results show that employers are quite conscious regarding sustainability practices in the galleys. To support this awareness, it may be necessary to direct them to the purchase of local products. In addition, information on new methods for recycling food waste and energy-efficient cooking equipment can be provided to update the practices.

The most important practices to be implemented in the galley, especially in terms of sustainability, are recycling and circular economy practices. The first step in this regard should be to educate and raise awareness among galley staff. Although the survey results show that 80% of the employers are aware of this issue, it is seen that 20% of them still do not have a mature idea about the topic.

Therefore, it has been determined that there is a need to raise the awareness of employers, albeit a small portion of them, on recycling practices in the galley.



“How important do you consider the frequent check of compliance regarding rules with sustainability goals and environmental regulations by the galley management? (%)”



Employers increasingly view the frequent checking of compliance with sustainability goals and environmental regulations by galley management as highly important. This shift in focus is most probably driven by several key factors:

Regulatory Requirements

Legal Compliance and International Standards: Many industries, particularly in shipping and aviation, are subject to strict environmental regulations. Non-compliance can result in significant fines, legal actions, and even operational shutdowns. Regular checks ensure that the galley adheres to these regulations, reducing the risk of penalties. Employers often need to comply with international environmental standards,

such as MARPOL (International Convention for the Prevention of Pollution from Ships) for maritime operations. Galley management must regularly ensure compliance with these standards to maintain certifications and operational approvals.

Corporate Social Responsibility (CSR)

Employers are increasingly committed to CSR, which includes environmental sustainability. Frequent checks on compliance with sustainability practices in the galley demonstrate a company's dedication to its CSR goals, enhancing its reputation with customers, stakeholders, and the public. On the other hand, a strong commitment to environmental practices can improve the company's brand image, making it more attractive to environmentally conscious customers and partners. Employers expect galley management to contribute to this by ensuring compliance.

Operational Efficiency and Cost Savings

Sustainable practices, such as reducing waste and conserving energy, can lead to cost savings. Regular compliance checks help ensure that these practices are consistently applied, maximizing efficiency and reducing operational costs. Ensuring compliance with waste management regulations not only helps the environment but also reduces disposal costs and potential waste-related fines.

Employee and Customer Expectations

Workplace Culture and Customer Demands. Employees increasingly expect their employers to prioritize sustainability. Galley management that frequently checks and enforces compliance can foster a culture of environmental responsibility, which can boost morale and attract talent. Customers are becoming more eco-conscious and prefer companies that demonstrate a commitment to sustainability. Employers recognize that maintaining high standards of compliance in all areas, including the galley, is essential to meet customer expectations.

Managing Risks: Non-compliance with environmental regulations can lead to significant risks, including pollution incidents, which can have severe financial and reputational consequences. Regular checks help mitigate these risks by ensuring that the galley operates within the required environmental parameters.

Reaching Sustainability Goals: Many companies set ambitious sustainability targets, such as reducing carbon emissions or achieving zero waste. Frequent checks help ensure that the galley contributes positively to these broader corporate goals.

Improving Continuously: Regular compliance checks provide opportunities for identifying areas of improvement and implementing new sustainable practices. Employers value galley management that proactively seeks to enhance sustainability efforts.

In summary, employers consider the frequent checking of compliance with sustainability goals and environmental regulations by galley management to be essential. It aligns with legal requirements, supports corporate goals, enhances reputation, and reduces operational risks. As sustainability becomes increasingly integral to business strategy, this aspect of galley management is gaining even more importance.

Survey results show that employers are aware of the importance of frequent checks of compliance regarding rules with sustainability goals and environmental regulations for maintaining and developing sustainability practices in galleys.

HYGIENE

Hygiene in the galley is crucial for several important reasons, all of which contribute to the overall health and safety of the crew or passengers, as well as compliance with regulations and maintaining operational efficiency. Here's why hygiene is so essential in a galley:

Prevention of Foodborne Illnesses

The primary reason for maintaining strict hygiene standards in the galley is to prevent foodborne illnesses. Poor hygiene can lead to contamination of food with harmful bacteria, viruses, or parasites, which can cause serious illness among the crew or passengers. On ships, where medical assistance may be limited, preventing such outbreaks is critical. Proper hygiene practices, such as regularly washing hands, sanitizing surfaces, and separating raw and cooked foods, help prevent cross-contamination, which is a leading cause of foodborne illness.

Compliance with Regulations

Galleys are subject to strict health and safety regulations. Maintaining high hygiene standards ensures compliance with these regulations, helping to avoid penalties, fines, or even the closure of the galley. Ships need to comply with international food safety standards, such as those set by the World Health Organization (WHO) or the International Maritime Organization (IMO). Hygiene is a key component of these standards, and failure to meet them can result in operational issues.

Maintaining Reputation and Trust

In passenger operations, such as cruise ships or airlines, the quality and safety of the food served are directly tied to the company's reputation. Poor hygiene leading to food safety incidents can significantly damage the reputation and result in loss of customer trust. For crew members on ships or aircraft, the quality of food is closely linked to morale. Ensuring that the food is prepared and served in a hygienic environment contributes to overall well-being and job satisfaction.

Legal Liability

Poor hygiene can lead to serious legal liabilities if crew or passengers become ill. Lawsuits, compensation claims, and insurance issues can arise from food safety incidents, so maintaining hygiene helps mitigate these risks. Regular health inspections and audits are common in the food service industry. Galleys must pass these inspections to continue operations, and good hygiene practices are key to success.

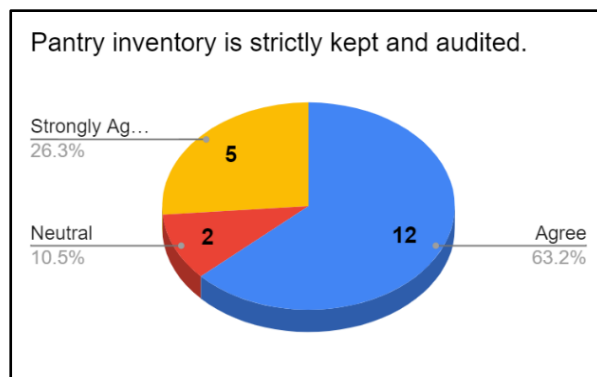
Environmental Impact

Good hygiene practices help prevent infestations by pests, such as rodents or insects, which can be attracted by food waste or unsanitary conditions. These pests can spread disease and contaminate food, further endangering health. On the other hand, proper disposal of waste, including food scraps and packaging, is a part of maintaining hygiene. This reduces the environmental impact of the galley and contributes to overall sustainability goals.

All in all, hygiene in the galley is essential for ensuring the health and safety of all who consume the food, complying with regulations, maintaining the company's reputation, and ensuring smooth and efficient operations. Given the confined nature of ships and aircraft, where issues can escalate quickly, maintaining impeccable hygiene standards is particularly critical.

“Please specify how much you agree with the following statements regarding hygiene and safety. (%)”

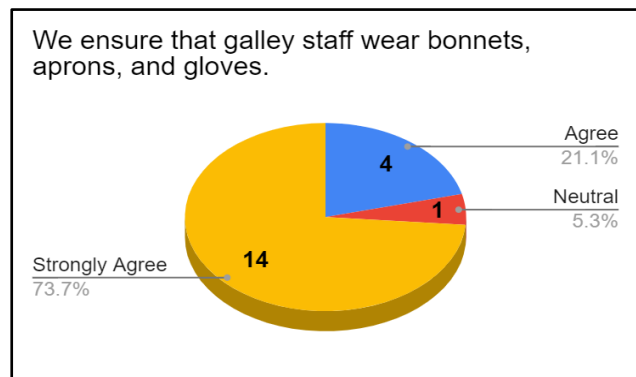
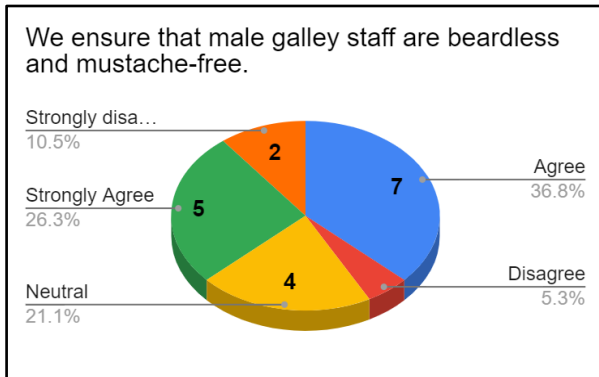
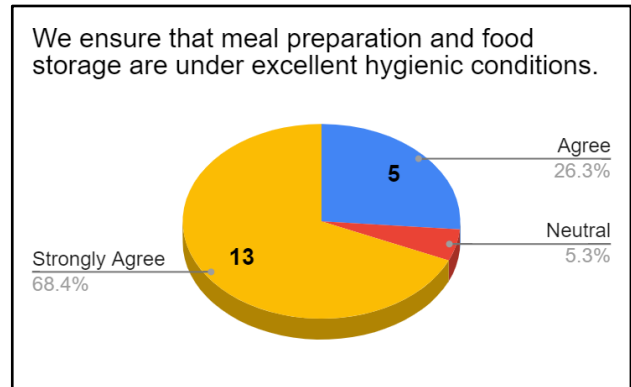
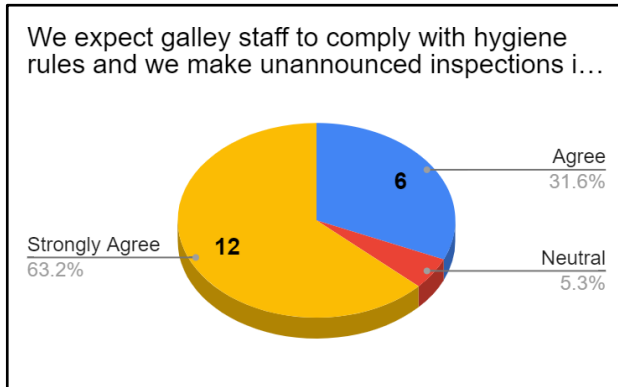
Hygiene is an important issue everywhere, but it is even more important in closed environments where



there is little contact with the outside world. Because in such environments, the spread of germs, bacteria, viruses, etc. becomes easier. The ship is such an environment. Therefore, it is of great importance to pay attention to hygiene rules on the ship, especially in the galley. The results of the survey show that employers in the maritime sector are conscious of hygiene issues. They ensure that meals are prepared

under hygienic conditions and carry out periodic inspections and fumigation in the galley and food-related areas.

It was also found that employers attach importance to keeping a strict storage inventory and auditing it so that they can both identify missing items and those that need to be replenished and take action on food that is nearing or past its expiry date.



One of the most important details about hygiene in the galley is the cleanliness of the galley staff and the suitability of their attire for working in the galley. Maritime Institute of Technology and Graduate Studies (MITAGS) states that the galley, like all kitchens, requires a specific set of worker hygiene and attire standards [4].

Galley Hygiene Standards

All galley workers and crew members should uphold high hygiene standards while in the galley. Foodborne illness is a frequent cause of sickness aboard cargo ships. In severe cases, these illnesses can be transported to land and infect others or cause your entire crew to postpone operations until recovered.

Proper galley hygiene includes:

- Washing your hands when entering the galley or after using the restroom and drying them with disposable towels.
- Eliminating all spoiled or contaminated food promptly.
- Clearly labeling food products and storing them at the appropriate temperatures.
- Cleaning and disinfecting the galley and utensils each day.
- Removing jewelry, including rings and watches, before working with food.
- Treating and covering all open wounds.
- Wearing gloves when working with food and changing them as they become contaminated.
- Refraining from smoking in the galley.
- Using an approved grease trap to catch all grease before discharging or treating galley waste.

To promote these standards, implement regular galley inspections.

MITAGS also stated Galley Worker Attire and gave the following rules.

Galley workers should wear appropriate attire to prevent injuries like burns or cuts. This attire includes:

Closed-toe, slip-resistant shoes

Aprons

Disposable gloves

Hairnets and beard nets

Clothes should always be clean and laundered, including aprons. All hair, including facial hair, should be neatly groomed and secured away from the food [5].

In parallel with this information, the answer given to the question asking whether the galley staff are beardless and mustache-free shows that there are some gaps in this regard. While 63,1% of the participants stated that they pay attention to the fact that these galley staff are beardless and mustache-free, 15,8% stated that they do not pay attention to this issue and 21,1% abstained. These results suggest the need for more awareness-raising on this issue.

TRAINING AND EDUCATION

Regardless of the subject and level, education and training is a process that is expected to adapt to the objectives and expectations of the people getting it, to respond to the needs, and to be constantly updated. This is also the case for the ship's galley staff. Before evaluating the survey questions in this section, it is good to answer the question of what kind of training can be provided by the employer to the galley staff.

What kind of training can employers provide the galley staff with?

Employers can provide a variety of training and education programs to galley staff to ensure they are well-equipped to maintain high hygiene, safety, and efficiency standards. These programs can cover a wide range of topics, from food safety to sustainability practices. Here are key areas of training and education that can be offered:

Food Safety and Hygiene Training

Regulatory and Compliance Training

Sustainability and Environmental Awareness

Health and Safety Training

Culinary Skills and Menu Planning

Teamwork and Communication Skills

Cultural Sensitivity and Customer Service

Technology and Innovation

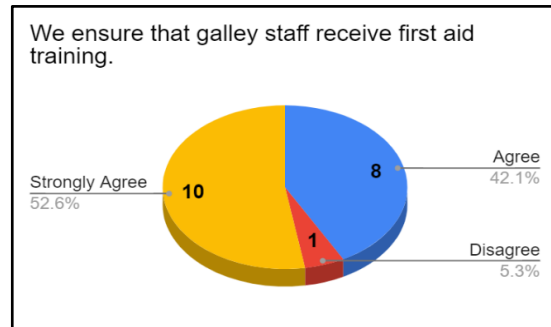
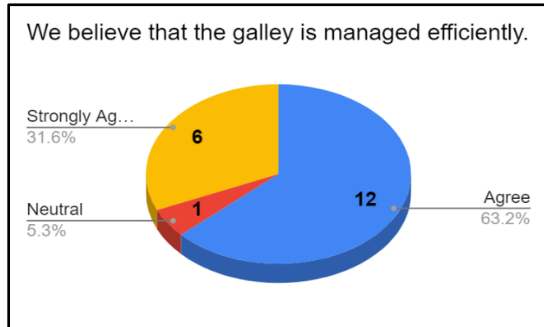
Leadership and Management Skills (for Supervisors)

Certification Programs

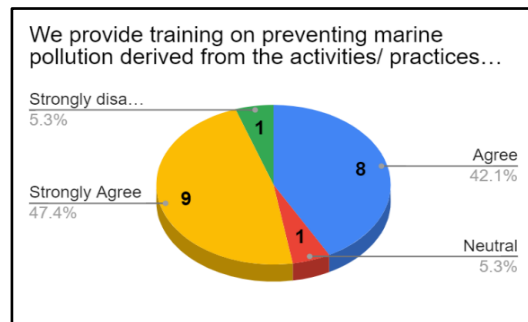
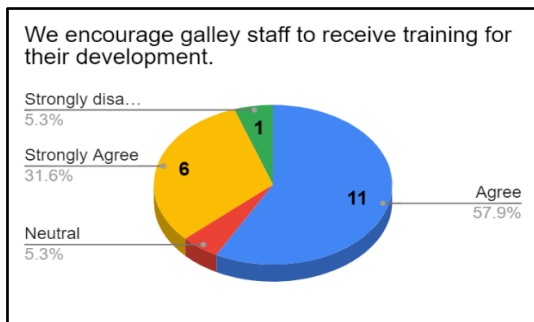
By providing comprehensive training and education in these areas, employers can ensure that galley staff are well-prepared to handle the challenges of their roles, maintain high standards of safety and quality, and contribute to the overall sustainability and efficiency of the operation. Following are the questions from the survey related to this topic:

“Please specify how much you agree with the following statements regarding training and life-long learning. (%)”

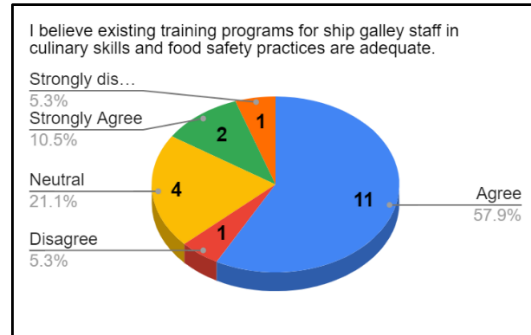
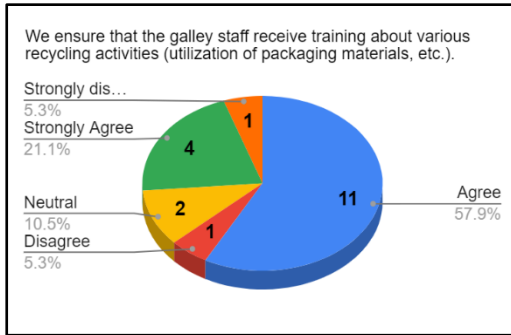
The statements are arranged according to the abundance of the responses of “Agree” and “Strongly Agree”.



The statement about the efficient management of the galleys got the most “Agree” or “Strongly Agree” answers. %94,5 of the employers think the galleys are managed efficiently. This is followed by the question related to “first aid training of the galley staff”. %93,8 of the respondents ensure the galley staff get the first aid training. These results indicate there is not much to improve in the situation regarding these topics since they are already considered improved.



The next two questions, which were both agreed upon by %89,5 of the employers, are about training for the general development of the galley staff regarding issues related to the galley and training for the prevention of marine pollution. Both responses reflect the satisfaction of the employers with the pieces of training the galley staff is provided with.



%79 of the employers believe the training provided for recycling in the galley is enough. That is %21 of them do not think so and something should be done to train and educate the staff for more efficient recycling methods. Responses given to the last statement contradict those given to the first statement to some extent. While the first statement indicated that the employers find the training and education adequate for the galley staff, the last statement says training for culinary skills and food safety practices should be improved. That means they believe the galley staff needs training on the topics mentioned, that is *recycling, culinary skills, and food safety practices*.

The Most Important Culinary Skills for Galley Staff

Galley cooks need a variety of hard skills to excel in their role. They must be proficient in food handling and preparation, including meal planning and the operation of galley equipment. They should also be able to maintain equipment and ensure proper sanitation and hygiene practices. Additionally, they need to be able to handle inventory and stock availability and be knowledgeable about dietary restrictions.

On the other hand, galley cooks also require certain soft skills. They need to be able to accept payments and handle customer complaints onboard cruise ships. They must also be able to work well in a fast-paced environment, handling tasks such as conducting safety meetings and fire drills. Being able to coordinate meal planning and prepare healthy meals is also crucial for success in this role.

A study conducted by Zippia found that 77.2% of galley cook resumes contained food handling as a skill. The same study compiled a list of the most critical galley cook skills and ranked the top skills for galley cooks based on the percentage of resumes they appeared on. According to this, the most important galley cook skills are the following.

1. Food Handling

Food handling is the process of preparing and storing food safely. Galley cooks use food handling by following safety guidelines, adhering to sanitation requirements, and maintaining proper storage and

cooking temperatures. They also train employees in proper cooking temperatures and food handling/safety requirements.

Galley staff use food handling to maintain proper/hygienic food handling techniques and overall sanitation requirements of the food service area and the personnel.

2. Meal Planning

Meal planning is the process of deciding what food to prepare and serve. Galley cooks use meal planning to coordinate food preparation and ensure cost control. They handle all aspects of meal planning and preparation, from deciding on the menu to preparing the meals in a large-scale industrial galley.

They use meal planning to coordinate meal planning with quality food preparation on a daily and ongoing basis with an emphasis on cost control.

3. Kitchen Equipment

Kitchen equipment includes tools and appliances used in food preparation, such as stoves, refrigerators, and utensils. Galley cooks use this equipment to prepare food orders according to specifications. They also maintain sanitation and safety by regularly inspecting and cleaning this equipment. For example, they clean kitchen equipment, organize produce delivery, and practice all safety procedures.

Cooks use kitchen equipment to maintain the sanitation of equipment and the general kitchen area and to prepare food orders following specifications, maintain kitchen equipment, communicate effectively, and participate in teamwork.

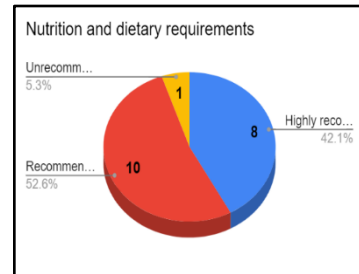
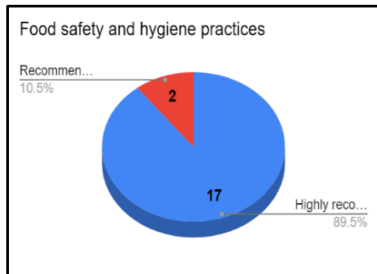
4. Fresh Coffee

Fresh coffee is a staple in many galley kitchens. Galley staff prepare and maintain a constant supply of fresh coffee. They also clean and sanitize the equipment needed to prepare it.

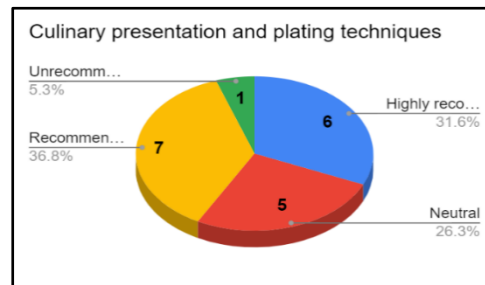
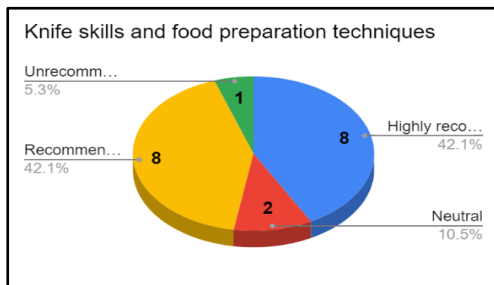
5. Food Preparation Equipment

Food preparation equipment is any tool or machine used to prepare food. Galley staff use this equipment to prepare and cook food. They also clean and sanitize it to maintain a clean work area. They ensure the equipment is in proper working order to get the job done efficiently.

“Which of the following specific areas of culinary skills training should be prioritized for ship galley staff? (%)”

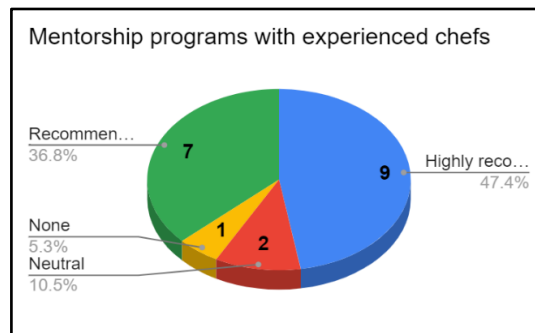
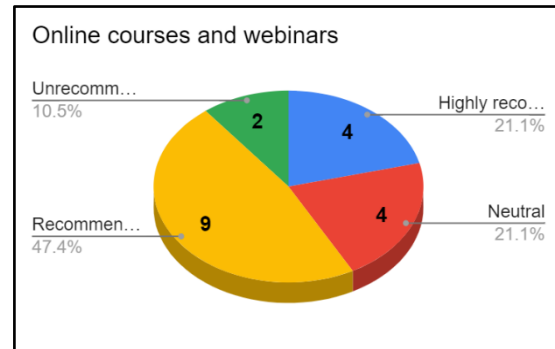
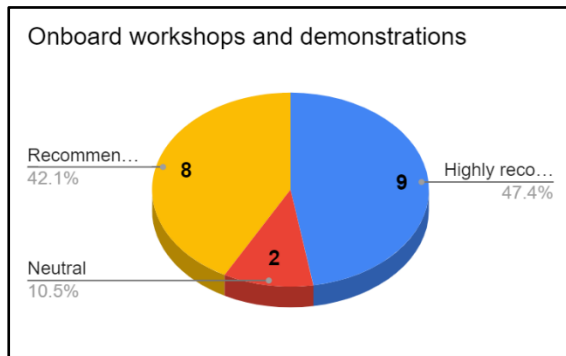
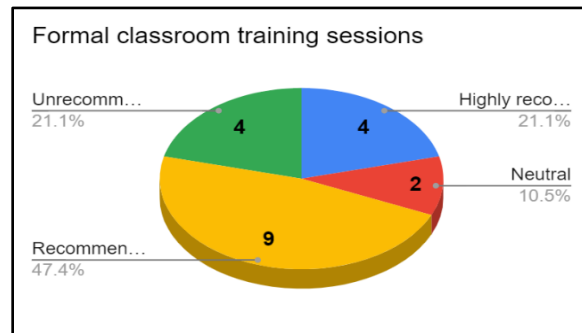


As the figures show, employers want galley staff to be trained in food safety and hygiene in the first place. Menu planning and recipe development are equally important for the galley staff in the opinion of the employers. This is followed by nutrition and dietary requirements.



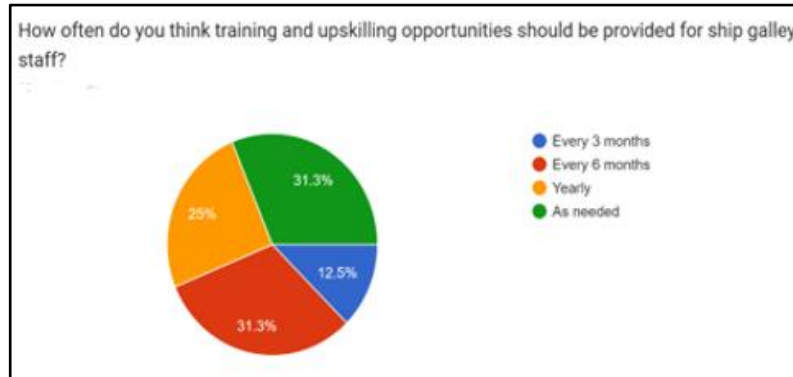
They think galley staff should be good at knife skills and food preparation techniques as well as culinary presentation and plating techniques. These are general topics the employers prioritize; however, it does not mean the galley staff needs training and education regarding these it means they should be good at these skills.

“Which of the following formats of training delivery would be most effective for ship galley staff? (%)”



Responses given to these statements once again prove that the best method to learn is considered “learning by doing”. The method recommended most is practical hands-on training in a culinary facility followed by mentorship programs with experienced chefs. The least recommended ones are online courses and webinars, where the learners are passive watchers.

“How often do you think training and upskilling opportunities should be provided for ship galley staff?”



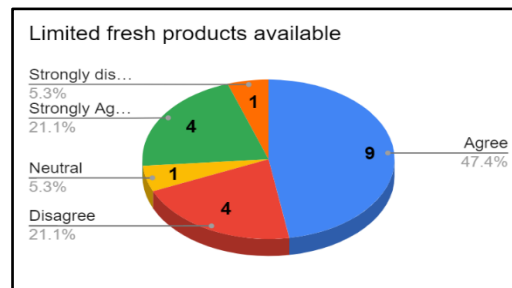
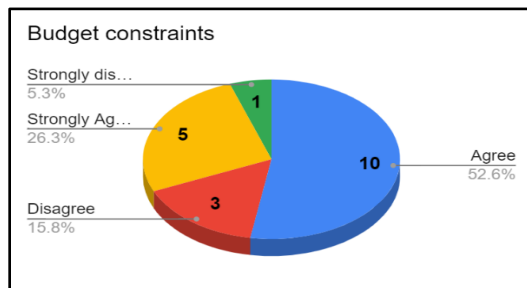
As the figure shows, training and upskilling opportunities are two important and demanded activities by employers. They want the galley staff to take such refreshing activities, however, there is not a consensus concerning the frequency of these trainings. The options of every 6 months and as needed were preferred at equal rates by the employers, followed by yearly. The least preferred one was every three months. Based on these results, it seems appropriate to provide this training at intervals of at least 6 months and/or when necessary.

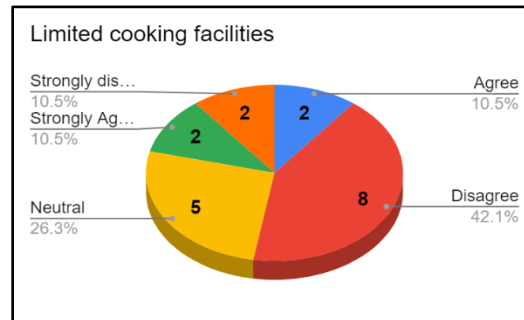
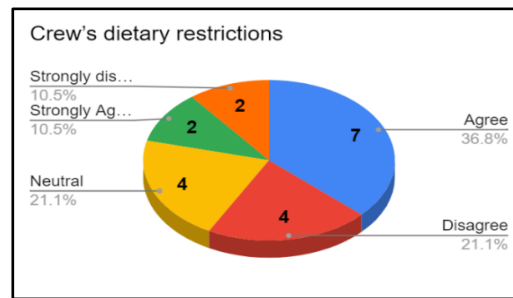
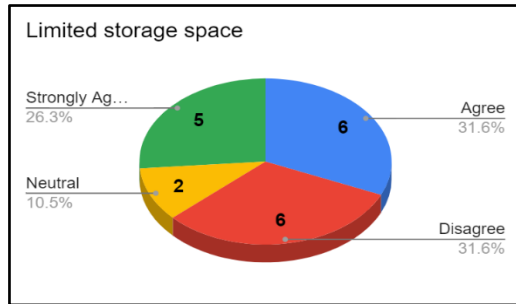
CHALLENGES

In this section, the opinion of employers in the maritime sector is asked for the main challenges regarding galleys and their staff. There are two questions in this section. The questions and responses by the employers are given below:

“Which of the following do you consider the main challenges for providing healthy and nutritious food options onboard ships? (%)”

Challenge	%
a. Budget constraints	78,9
b. Limited fresh products available	68,5
c. Limited storage space	57,9
d. Crew’s dietary restrictions	47.3
e. Limited cooking facilities	21





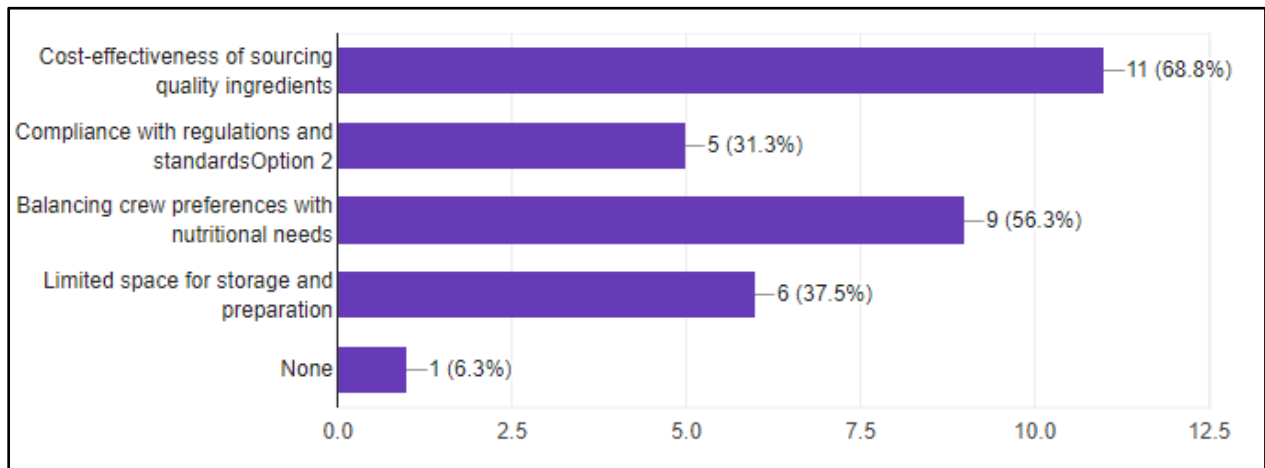
The obstacles to providing healthy and nutritious food are given in the order determined by employers. As the choices show the most important factor preventing the galley staff from preparing healthy and nutritious food is budget constraints. Followed by limited fresh food available. The third factor is the shortage of storage space and the fourth one is crew dietary restrictions. The last factor in this list is limited cooking facilities. It can be concluded that the galley staff are not free to buy whatever they want because of two reasons: lack of money and lack of available food. Even if they have a budget big enough to buy whatever they like they may not do so because of being away from fresh markets.

Another factor is seen as limited storage space. This means they may not store all they may need during their time at sea, so they buy them at the ports they go to. That may mean it can be hard for them to find fresh and good quality materials.

Crews' dietary restrictions are another factor that keeps them from providing healthy and nutritious food, although not as effective as the other factors. Because of these restrictions, galley staff may not prepare whatever they like, they may have to change the menu or limit their food choices.

Limited cooking facilities are the last factor that plays a role as a challenge for providing healthy and nutritious food since %79 of the employers think cooking facilities are good enough onboard.

“What challenges do you encounter in ensuring the availability of healthy and nutritious food options onboard your ships? (Select all that apply) (%)”



In employers’ opinion, the biggest challenge is the “cost-effectiveness of sourcing quality ingredients”. The cost-effectiveness of sourcing quality ingredients in galleys onboard is vital for maintaining budgetary constraints, ensuring the well-being of the crew, reducing waste, complying with regulations, and supporting sustainable operations. Balancing cost with quality ensures that the crew is well-fed, healthy, and satisfied while keeping operational costs under control. The employers find this option the most challenging one for them. The second most challenging option for employers is “Balancing crew preferences with nutritional needs”. This can be challenging for several reasons, primarily due to the diverse nature of crew members, the limitations of the galley environment, and the complexities of maintaining both satisfaction and health over extended periods. “Limited space for storage and preparation” and “Compliance with regulations and standards” are the next two factors the employers find challenging, although not as much as the first two.

These findings are important regarding the content of the training module for galley staff, who are directly affected by these challenges. This is because they have been identified by employers, but they are more likely to be of concern to galley staff and require them to take preventive or regulatory measures.

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CONCLUSION

SURVEY for STUDENTS and SEAFARERS

The analysis of the responses to this survey gave the following results:

- Students and seafarers are quite conscious about the consumption of some foods, but more than half of the participants do not have healthy eating habits. It has been found that they do not have full knowledge about what they should eat to be strong, especially in the harsh circumstances onboard the ships, and that they do not consume enough of the basic nutrients that are necessary for strong health. Some sailors and students are careful and conscious about this issue. However, almost half of the participants do not consume enough vegetables, fruit, eggs, offal, and legumes and do not drink enough water. Considering this information, it is concluded that students and seafarers need detailed information about proper nutrition, and they also need to refresh their existing knowledge on the issue.
- 84.4% of the respondents accepted the motivating role of good food onboard.
- A little bit more than half of them said they were satisfied with the current provision of healthy and nutritious food onboard, which also means almost half of them are not happy with the current food provision or have not had any idea concerning the food onboard.
- Most respondents are aware of the sustainability concerns regarding food, bread, and water and they try not to waste them. However, responses to the question about environmental sustainability in the survey make it clear that participants need training to be more conscious of protecting the environment.
- Another important finding is that although most participants in the survey give importance to hygiene there are still some of them who are not so careful about this issue. On the other hand, respondents have doubts that the galley and food-related utensils are clean enough. Based on this result, it can be concluded that more attention should be paid to cleanliness and hygiene in the ship's galley and dining hall.
- The proportion of seafarers and students who think that the galley is managed successfully is not very high.
- Only half of the participants think that the galley is managed efficiently or very efficiently, 20% of the respondents think that it is managed inefficiently, while the rest of the participants do not have a positive or negative opinion. This result indicates that something needs to be done for the efficient management of galleys.

GALLEY STAFF

Upon the analysis of the second survey, about the galley staff, the following results have been reached:

- Most galley staff think they know what they should cook to keep the crew healthy. It means that they know the nutritional values and properties of foods and the food groups that seafarers need to work efficiently.
- They also know the positive effects of good food on people, and why eating a nice meal is important for the motivation of the crew.
- About ten percent of the respondents do not know much about menu planning. Although this is a low number, this is a very important issue, and it is crucial to provide both the existing galley staff and the new entrants with some kind of refreshing training and examples of good practices.
- Galley staff know how important it is to cook meals belonging to different nations; however, about one-fourth of the respondents need to know the international recipes.
- It would be appropriate to inform galley staff about the basic foods that should be kept in the galley all the time, and what their nutritional values are.
- The majority of the personnel are quite knowledgeable about sustainability. However, since this result cannot be generalized to all staff, it should be ensured that all galley staff are aware of this issue and for this, training on sustainability should be provided.
- Galley staff need to be well informed about this issue. It is necessary to follow the developments in the field of environmentally friendly practices in galleys or galleys to provide refreshment training for the staff. They should know what steps they can take both individually and together with the other members of the galley staff to provide sustainability in the galleys.
- The galley staff obey the hygiene rules except for the failure to wear aprons, bonnets, and gloves. On the other hand, allowing unauthorized persons to enter the galley is a negative step that jeopardizes hygiene. For this reason, it is beneficial to reconsider the hygiene issue in general in all aspects and to increase the level of awareness of the personnel by providing training at specified intervals to refresh their knowledge and inform them about emerging threats that may cause problems.
- Training programs for culinary skills and food safety practices should be provided regularly to ensure that galley staff stay updated with best practices, regulations, and evolving culinary trends. The frequency of these training programs can depend on several factors, such as the nature of the ship's operations, crew turnover, and changes in food safety regulations.
- The problems that the galley staff have regarding fresh ingredients and budget constraints are the ones that should be solved as soon as possible.
- Galley staff should be provided with more storage space and more fresh products.

EMPLOYERS

The number of employers who participated in the survey is not high, despite this, their responses to the questions were analyzed to have an idea, albeit roughly, on the issue. The results of the survey are given below:

- Employers in the maritime sector are sufficiently knowledgeable and interested in the diet and needs on board. They have sufficient knowledge about the reasons why seafarers should be well-nourished and the positive effects of good nutrition on health, motivation, and work efficiency. However, it would be better if they could consider the individual nutritional characteristics and problems of seafarers such as allergies.
- Employers are conscious of the culturally important days or events for the seafarers, and they tend to prepare the menu to celebrate them. They are also aware of the importance of including different cultures on the menu.
- Employers do not fully support the existence of women in the galley to a certain degree; however, they should pay attention to the fact that some of the personnel working in the galley should be women to provide diversity and bring the perspective of a different gender to the galley
- Employers should value the innovative and entrepreneurial ideas of their galley staff and even encourage them to come up with such ideas.
- They should learn about the importance of sustainability, recycling all waste materials in the galley, and portion control., some precautions should be taken to make employers more aware of the latest trends in recycling, sustainability, and circular economy, which in turn gives the same mindset to the staff.
- Employers attach importance to keeping a strict storage inventory and auditing it so that they can both identify missing items and those that need to be replenished and take action on food that is nearing or past its expiry date.
- Training and upskilling opportunities are two important and demanded activities by employers. They want the galley staff to take such refreshing activities, however, there is not a consensus concerning the frequency of these trainings. Based on these results, it seems appropriate to provide this training at intervals of at least 6 months and/or when necessary.

The data obtained from the surveys will be used to design a training course that meets the specific needs and preferences of ship galley staff, equipping them with the necessary skills and knowledge to excel in their roles, improving onboard food services, and creating new job opportunities for ship galley staff, and contribute to the overall success of maritime operations. The reason for taking opinions from stakeholders other than the galley staff is to evaluate the galley and its staff from different perspectives and to identify the issues criticized or found deficient by the stakeholders. Thus, the module to be prepared will be able to include topics that will reinforce the missing points and further strengthen the topics that are seen as strong.

The topics to be covered by the module “Onboard Healthy Nutrition” according to the survey results		
SEAFARERS AND STUDENTS	GALLEY STAFF	EMPLOYERS
Proper Nutrition and Well-Being	Proper Nutrition and Well-Being	Proper Nutrition and Well-Being
Sustainability	Sustainability	Sustainability
Hygiene	Hygiene	Hygiene
Effects of Good Food	Victualling	
General Impression	Training and Education	Training and Education
	Challenges	Challenges

In some topics, a detailed study and a thorough explanation of the subject are needed, while in other topics only a refresher, reminder, or update is necessary. Hence, the topics where detailed training is needed are marked in pink on the table.

Detailed study; comprehensive training and education -----

It was found that participants had incomplete knowledge of some issues. In such cases, it would be more appropriate to prepare a training program aimed at eliminating the deficiencies rather than providing in-depth information on the subject. Such topics are marked in green on the table.

Complementary and gap-filling training and education -----

It is concluded that the participants have sufficient knowledge of some topics, and they only need to follow the developments in these areas. Such topics are marked in blue on the table.

Refreshing training and education -----

SURVEYS

This section includes 3 surveys prepared and implemented within the scope of the project. The surveys aim to gather insights and perspectives from various stakeholders, including seafarers, ship owners, and galley staff, within the maritime industry. Specifically, they focus on enhancing marine culinary arts and creating new job opportunities for ship galley staff development under the EU Blue Skills strategy through a comprehensive training course tailored to the specific needs of galley personnel in the context of the **EU Project Cul-Mar-Skills**. (*Maritime Soft Skills for Onboard Healthy Nutrition and Culinary Arts in Seagoing Services*)



Piri Reis University, Cookery Department Students in their “Practice Galley”

THE SURVEY FOR SEAFARERS AND STUDENTS

1. What is your role on board?	1. Student			2. Seafarer	
2. What is your age?	18-25	26-35	36-45	46-55	56+
3. What is your gender?	1. Female			2. Male	
	3. Non-binary			4. Prefer not to say	
4. Are you vegetarian/vegan?	Yes			No	
5. Do you smoke/ vape?	1. No			2. Ex-smoker/ vaper	
	3. Tobacco/ cigarette			4. Electronic cigarette	
6. In what type of vessel do you work?	1. Passenger ship			3. Yacht	
	2. Cargo ship (tanker/ container)			4. School ship	
7. How many years have you worked on board?	Less than 1 year	1-5 years	6-10 years	11-15 year	16+
8. Thinking about working on board, do you experience any of the following conditions?					
a. Weight change	1. No change	2. Weight loss		3. Weight gain	
b. Diarrhea, digestive system disease	1. Never	2. Rarely		3. Sometimes	
	4. Often	5. Always			
c. Weakness/ fatigue/ exhaustion	1. Never	2. Rarely		3. Sometimes	
	4. Often	5. Always			
d. Attention and perception problems	1. Never	2. Rarely		3. Sometimes	
	4. Often	5. Always			
e. Sleep problems	1. Never	2. Rarely		3. Sometimes	
	4. Often	5. Always			
f. Bone/ muscle pain	1. Never	2. Rarely		3. Sometimes	
	4. Often	5. Always			
g. Stress/ depression/ anxiety/ mood disorders	1. Never	2. Rarely		3. Sometimes	
	4. Often	5. Always			
9. Please specify how often you consume the following food groups:					
	Daily	Weekly	Monthly	Rarely/Never	
Fresh fruit	4	3	2	1	
Dried fruit	4	3	2	1	
Fresh vegetables	4	3	2	1	
Cooked vegetables	4	3	2	1	
Legumes/ pulses (e.g., lentils, beans, chickpeas)	4	3	2	1	
Potatoes	4	3	2	1	
Dairy products (yogurt/ milk/cheese)	4	3	2	1	
Wholemeal bread and cereals	4	3	2	1	
Wholemeal pasta	4	3	2	1	
White bread and cereals	4	3	2	1	
White pasta	4	3	2	1	
Eggs	4	3	2	1	
Chicken/ turkey	4	3	2	1	
Fish	4	3	2	1	

Red meat (any of beef/ lamb/ pork)	4	3	2	1	
Offal (e.g. liver)	4	3	2	1	
Processed meat (cold meats/ charcuterie/ sausages/ delicatessen)	4	3	2	1	
Seeds and nuts	4	3	2	1	
Olive oil/ olive oil spreads	4	3	2	1	
Butter/ margarine	4	3	2	1	
Pastry (e.g. croissants, pies, tarts, pasties)	4	3	2	1	
Desserts (including baklava and ice cream)	4	3	2	1	
Alcoholic beverages (i.e., wine, beer, spirits)	4	3	2	1	
Non-alcoholic beverages (i.e., soft drinks, juice from concentrate)	4	3	2	1	
9. How many glasses (250mL) of water do you drink per day?		1-3	4-5	6-8	8+
10. How often do you eat the following food groups when you feel hungry?					
	Daily	Weekly	Monthly	Rarely/Never	
a. Fresh fruit/ vegetables	4	3	2	1	
b. Bakery products (i.e., toast, cake, pastry)	4	3	2	1	
c. Biscuits, candy, chocolate	4	3	2	1	
d. Crisps and snacks	4	3	2	1	
11. Please specify how often you consume "out-of-home" meals:					
	Daily	Weekly	Monthly	Rarely/Never	
a. Work/ school canteen	4	3	2	1	
b. Fast-food restaurant (i.e., pizza, burger)	4	3	2	1	
c. Other restaurant	4	3	2	1	
12. Please specify how often do you:					
	Daily	Weekly	Monthly	Rarely/Never	
a. Waste food (i.e., do not eat all the portions)	4	3	2	1	
b. Waste bread	4	3	2	1	
c. Wastewater	4	3	2	1	
13. On a scale of 1 (never) to 5 (always) please specify how often you...					
	Never	Rarely	Someti mes	Often	Always
a. Support the use of leftovers to prepare new meals					
b. Avoid the use of single-use plastic materials when dining					
c. Use refillable water bottles or glasses					
d. Buy local and fresh foods from ports					
e. Eat healthy when you want to					
f. Stock up on nuts (i.e., hazelnuts, walnuts, raisins) and dark chocolate before on board					
g. Eat junk food when under pressure/ stress					
h. I am picky about food.					
14. From a scale of 1 (strongly disagree) to 5 (strongly agree) please specify how much you agree with the following statements:					

	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
a. I eat plenty of fresh fruit and green leafy vegetables					
b. I follow a balanced diet					
c. I know what to eat to maintain my health on board					
d. I eat a lot of bread because I can't get enough food during the meal service					
e. I try to do simple workouts when on board to keep in good health					
f. When planning the menu, I believe the goal is to achieve a balanced diet while ensuring satiety					
g. Being aware of having a nice meal at the end of the day increases my work motivation					
h. I am satisfied with the current provision of healthy and nutritious food onboard.					
15. On a scale of 1 (strongly disagree) to 5 (strongly agree) please specify how much you agree with the following statements regarding "Tasty and special food":					
	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
a. Tasty food contributes to a positive atmosphere on board by creating a feeling of comfort, enjoyment, and camaraderie					
b. Tasty food contributes to the physical well-being of individuals on board					
c. Tasty food can positively affect mental health by improving mood, cognitive function, and general well-being					
d. Well-fed individuals are more alert, focused, and productive, which is essential for the efficient and safe performance of tasks on board					
e. Proper nutrition plays a vital role in optimizing performance and productivity					
16. On a scale of 1 (strongly disagree) to 5 (strongly agree) please specify how much you agree with the following statements regarding good hygiene practices:					
	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
a. I always wash my hands before any meal					
b. I am confident that tableware (i.e., plates, glasses, and cutlery) is properly clean					
c. I am confident that all meals are prepared in clean and healthy conditions					
17. From a scale of 1 (not recommended) to 5 (highly recommended) please specify which of the following food groups should be readily available onboard ships?					

	Highly Unrecommended	Unrecommended	Neutral	Recommended	Highly Recommended
a. Whole grains					
b. Fresh fruit and vegetables					
c. Plant-based foods (e.g. tofu, legumes)					
d. Nuts and seeds					
e. Lean proteins (e.g. fish, poultry)					
f. Low-fat dairy or dairy alternatives					
g. Other (<i>specify</i>):					
18. From a scale of 1 (strongly disagree) to 5 (strongly agree) which of the following environmental practices could be implemented in the galley operations onboard ships?					
	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
a. Locally sourced products					
b. Reduced use of single-use plastics					
c. Use of reusable or biodegradable utensils and containers					
d. Recycling of food waste					
e. Energy-efficient cooking equipment					
f. Other (<i>specify</i>):					
19. How satisfied are you with the current provision of healthy and nutritious food onboard ships?					
Highly dissatisfied	Dissatisfied	Neutral	Satisfied	Highly satisfied	
20. How efficiently do you think the galley is managed onboard ships?					
Highly inefficiently	Inefficiently	Neutral	Efficiently	Highly efficiently	

THE SURVEY FOR GALLEY STAFF

1. What is your role in the galley?	1. Steward	2. Cook	3. Messman		
2. What is your age?	18-25	26-35	36-45	46-55	56+
3. What is your gender?	1. Male		2. Female		
	3. Non-binary		4. Prefer not to say		
4. In what type of vessel do you work?	1. Yacht		2. Passenger ship		
	3. School ship		4. Cargo ship (tanker/ container)		
5. From a scale of 1 (strongly disagree) to 5 (strongly agree) please specify how much you agree with the following statements:					
	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
a. I know what to cook to maintain good health whilst on board					
b. I can prepare a balanced menu					
c. When planning the menu, I believe the goal is to achieve a balanced diet while ensuring satiety					
d. Having a nice meal at the end of the day increases the crew's work motivation					
6. From a scale of 1 (strongly disagree) to 5 (strongly agree) please specify how much you agree with the following statements regarding "Tasty food":					
	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
a. Tasty food contributes to a positive atmosphere on board by creating a feeling of comfort, enjoyment, and camaraderie					
b. Tasty food contributes to the physical well-being of individuals on board					
c. Tasty food can positively affect mental health by improving mood, cognitive function, and general well-being					
d. Well-fed individuals are more alert, focused, and productive, which is essential for the efficient and safe performance of tasks on board.					
e. Proper nutrition plays a vital role in optimizing performance and productivity					
7. Thinking about your cooking practices, how often do you...					
a. Avoid behaviors that may cause waste in the galley	1. Never	2. Rarely	3. Sometimes		
	4. Often	5. Always			

b. Make new dishes by using the leftovers of meals that were not served	1. Never	2. Rarely	3. Sometimes		
	4. Often	5. Always			
c. Pay attention to the expiration date of food items	1. Never	2. Rarely	3. Sometimes		
	4. Often	5. Always			
d. Use disposable plastic materials on the table	1. Never	2. Rarely	3. Sometimes		
	4. Often	5. Always			
e. Ensure the use of glass cups or thermos for water service	1. Never	2. Rarely	3. Sometimes		
	4. Often	5. Always			
f. Buy local and fresh food from ports	1. Never	2. Rarely	3. Sometimes		
	4. Often	5. Always			
g. Throw away any expired food product	1. Never	2. Rarely	3. Sometimes		
	4. Often	5. Always			
8. Thinking about your hygiene, how often do you...					
a. Wash your hands before eating	1. Never	2. Rarely	3. Sometimes		
	4. Often	5. Always			
b. Ensure that tableware (i.e., plates, glasses, and cutlery) is properly clean	1. Never	2. Rarely	3. Sometimes		
	4. Often	5. Always			
c. Prepare meals in clean and healthy conditions	1. Never	2. Rarely	3. Sometimes		
	4. Often	5. Always			
d. Wear a bonnet and gloves during meal prep in the galley	1. Never	2. Rarely	3. Sometimes		
	4. Often	5. Always			
e. Wear an apron during meal prep in the galley	1. Never	2. Rarely	3. Sometimes		
	4. Often	5. Always			
9. Thinking about your cooking skills, how often do you...					
a. Cook dishes from different cultures	1. Never	2. Rarely	3. Sometimes		
	4. Often	5. Always			
b. Adjust the menu as required by weather and sea conditions	1. Never	2. Rarely	3. Sometimes		
	4. Often	5. Always			
c. Get help from the crew when you face difficulties completing a task	1. Never	2. Rarely	3. Sometimes		
	4. Often	5. Always			
d. Know how many calories each menu should have	1. Never	2. Rarely	3. Sometimes		
	4. Often	5. Always			
10. From a scale of 1 (highly unrecommended) to 5 (highly recommended) please specify which of the following food groups should be readily available onboard ships?					
	Highly unrecommended	Unrecommended	Neutral	Recommended	Highly recommended
a. Whole grains					
b. Fresh fruit and vegetables					
c. Plant-based foods (e.g. tofu, legumes)					
d. Nuts and seeds					
e. Lean proteins (e.g. fish, poultry)					

f. Low-fat dairy or dairy alternatives					
g. Other (<i>specify</i>):					
11. From a scale of 1 (strongly disagree) to 5 (strongly agree) which of the following do you consider as main challenges for providing healthy and nutritious food options onboard ships?					
	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
a. Limited storage space					
b. Limited fresh products available					
c. Limited cooking facilities					
d. Budget constraints					
e. Crew's dietary restrictions					
f. Other (<i>specify</i>):					
12. From a scale of 1 (strongly disagree) to 5 (strongly agree) which of the following environmental practices could be implemented in the galley operations onboard ships?					
	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
a. Locally sourced products					
b. Reduced use of single-use plastics					
c. Use of reusable or biodegradable utensils and containers					
d. Recycling of food waste					
e. Energy-efficient cooking equipment					
f. Other (<i>specify</i>):					
13. How would you rate the adequacy of existing training programs for ship galley staff in culinary skills and food safety practices?					
Highly Inadequate	Inadequate	Neutral	Adequate	Highly Adequate	
14. How often do you think training and upskilling opportunities should be provided for ship galley staff?			1. Every 3 months		2. Every 6 months
			3. Yearly		4. As needed
15. From a scale of 1 (not recommended) to 5 (highly recommended) which of the following specific areas of culinary skills training should be prioritized for ship galley staff?					
	Highly unrecommended	Unrecommended	Neutral	Recommended	Highly recommended
a. Nutrition and dietary requirements					
b. Menu planning and recipe development					
c. Food safety and hygiene practices					
d. Knife skills and food preparation techniques					
e. Culinary presentation and plating techniques					
f. Other (<i>specify</i>):					
16. From a scale of 1 (not recommended) to 5 (highly recommended) which of the following formats of training delivery would be most effective for ship galley staff?					
	Highly unrecommended	Unrecommended	Neutral	Recommended	Highly recommended
a. Formal classroom training sessions					

b. Practical hands-on training in a culinary facility					
c. Online courses and webinars					
d. Onboard workshops and demonstrations					
e. Mentorship programs with experienced chefs					
f. Other (specify):					
17. As a member of the galley staff, how would you rate the current adequacy of resources and support provided for meal preparation onboard ships?					
highly inadequate	inadequate	neutral	adequate	highly adequate	
18. How often do you prioritize the inclusion of healthy and nutritious options in meal planning and preparation?					
Never	Rarely	Sometimes	Often	Always	
19. What are the main challenges you face in ensuring the provision of healthy and nutritious meals onboard ships?					
Limited availability for fresh ingredients					
Time constraints for meal preparation					
Working within budget constraints					
Limited kitchen equipment and facilities					
Other (Specify)					
20. What challenges do you encounter in ensuring the availability of healthy and nutritious food options onboard your ships? (Select all that apply)					
Cost-effectiveness of sourcing quality ingredients					
Compliance with regulations and standards					
Balancing crew preferences with nutritional needs					
Limited space for storage and preparation					
Other (please specify)					
21. What strategies do you employ or plan to implement to promote environmentally friendly practices in galley operations across your fleet? (Select all that apply)					
- Investing in eco-friendly equipment and technology					
- Providing crew training on sustainable practices					
- Collaborating with suppliers to source sustainable ingredients					
- Implementing waste management and recycling programs					
- Other (please specify)					
22. In your experience, what are some effective strategies for managing food waste in the galley?					
- Portion control and meal planning					
- Creative use of leftovers in subsequent meals					
- Composting organic waste					
- Collaboration with crew members to minimize plate waste					
- Other (please specify)					
23. What measures do you take to ensure food safety and hygiene standards are upheld in the galley?					
- Regular cleaning and sanitation protocols					
- Adherence to food storage and handling guidelines					
- Training and education on food safety practices					
- Monitoring and recording of temperature controls					
- Other (please specify)					

THE SURVEY FOR EMPLOYERS

1. From a scale of 1 (strongly disagree) to 5 (strongly agree) please specify how much you agree with the following statements regarding sustainability:					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
a. We are committed to using environmentally friendly products (e.g., ecological papers, natural cleaning materials, organic foods) in the galley					
b. We support social responsibility projects for the protection of the seas					
c. We always remind crew and staff to be mindful when using resources such as electricity, water, etc. in the galley					
d. We ensure buying products with plastic-free packaging					
e. We use pollutant-free and energy-efficient cooking tools in the galley					
f. We ensure that recyclable materials are used in the galley					
g. We support environmentally friendly products for cleaning (e.g., in the galley, doing the dishes)					
h. We recycle every waste material in the galley, with an emphasis on circular economy					
i. We prevent waste from being thrown into the sea					
j. We create a sustainable food menu					
k. We support the use of organic and natural products					
l. We encourage the inclusion of low-waste recipes on the menu to reduce food waste					
m. We support controlled portion sizes					
2. From a scale of 1 (strongly disagree) to 5 (strongly agree) please specify how much you agree with the following statements regarding cooking practices:					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
a. We are aware of nutritious diets to ensure seafarers' healthy nutrition.					
b. The menu is prepared to meet seafarers' daily energy requirements.					
c. We ensure that seafarers are both well-nourished and healthy to fulfill their duties					
d. It is important to purchase quality food for the galley					
e. We ensure the adequacy of water and food supplies for everyone on board.					
f. We pay attention to the quality of the water and food on board					
g. Nutritional value of the water and food on board is important					
h. We are aware of the crew's food allergies					

i. We are aware of diseases caused by malnutrition					
j. We consider offering a good menu as a motivational tool					
k. Employers buy local foods at the ports of call to motivate the crew.					
l. Crew and staff are allowed to eat whatever they like 24 hours a day					
3. From a scale of 1 (strongly disagree) to 5 (strongly agree) please specify how much you agree with the following statements regarding equity and diversion:					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
a. We ensure that meals that are part of the culture of the ship's personnel are also prepared					
b. We ensure that meals that are special on national/religious days for ship personnel belonging to different nationalities are prepared on these days.					
c. Special conditions of crew members, such as eating gluten-free, being allergic to certain foods, or being vegetarian, are considered					
d. We ensure a representative proportion of women in the galley staff.					
e. We consider the innovative and entrepreneurial ideas of galley staff and implement them if possible.					
4. From a scale of 1 (strongly disagree) to 5 (strongly agree) please specify how much you agree with the following statements regarding hygiene and safety:					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
a. We expect galley staff to comply with hygiene rules and we make unannounced inspections in this regard					
b. We ensure that meal prep and food storage are under excellent hygienic conditions					
c. We ensure that galley staff wear bonnets, aprons, and gloves					
d. We ensure that male galley staff are beardless and mustache-free					
e. Storage inventory is strictly kept and audited					
f. The galley and storage facilities are sprayed (fumigated) at regular intervals					
5. From a scale of 1 (strongly disagree) to 5 (strongly agree) please specify how much you agree with the following statements regarding training and life-long learning:					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
a. We ensure that the galley staff receive training about various recycling activities (utilization of packaging materials, etc.)					
b. We provide training on preventing marine pollution derived from the activities/ practices of the galley					
c. We encourage galley staff to receive training for their development					
d. We ensure that galley staff receive first aid training					

e. We believe that the galley is managed efficiently.					
f. I believe existing training programs for ship galley staff in culinary skills and food safety practices are adequate.					
6. From a scale of 1 (strongly disagree) to 5 (strongly agree) please specify how you assess the overall satisfaction of crew members with the food services provided onboard your ships.					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
a. Regular surveys and feedback mechanisms					
b. Informal feedback channels (e.g., direct communication with crew members)					
c. Observation and assessment by onboard management					
d. Other (<i>specify</i>):					
7. From a scale of 1 (strongly disagree) to 5 (strongly agree) which of the following do you consider as main challenges for providing healthy and nutritious food options onboard ships?					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
a. Limited storage space					
b. Limited fresh products available					
c. Limited cooking facilities					
d. Budget constraints					
e. Crew's dietary restrictions					
f. Other (<i>specify</i>):					
8. From a scale of 1 (strongly disagree) to 5 (strongly agree) which of the following environmental practices could be implemented in the galley operations onboard ships?					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
a. Locally sourced products					
b. Reduced use of single-use plastics					
c. Use of reusable or biodegradable utensils and containers					
d. Recycling of food waste					
e. Energy-efficient cooking equipment					
f. Other (<i>specify</i>):					
9. From a scale of 1 (strongly disagree) to 5 (strongly agree) which of the following strategies do you employ or plan to implement to promote environmentally friendly practices in galley operations across your fleet?					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
a. Investing in eco-friendly equipment and technology					
b. Providing crew training on sustainable practices					
c. Collaborating with suppliers to source sustainable ingredients					
d. Implementing waste management and recycling programs					
e. Other (<i>specify</i>):					
10. From a scale of 1 (highly unimportant) to 5 (highly important) how important do you consider the frequent check of compliance regarding rules with sustainability goals and environmental regulations by the galley management?					
Highly unimportant	Unimportant	Neutral	Important	Highly important	
11. How often do you think training and upskilling opportunities should be provided for ship galley staff?			1. Every 3 months	2. Every 6 months	
			3. Yearly	4. As needed	
12. From a scale of 1 (not recommended) to 5 (highly recommended) which of the following specific areas of culinary skills training should be prioritized for ship galley staff?					
	Highly unrecommended	Unrecommended	Neutral	Recommended	Highly recommended

a. Nutrition and dietary requirements					
b. Menu planning and recipe development					
c. Food safety and hygiene practices					
d. Knife skills and food preparation techniques					
e. Culinary presentation and plating techniques					
f. Other (<i>specify</i>):					
13. From a scale of 1 (not recommended) to 5 (highly recommended) which of the following formats of training delivery would be most effective for ship galley staff?					
	Highly unrecmended	Unrecommended	Neutral	Recommend ed	Highly recommend ed
a. Formal classroom training sessions					
b. Practical hands-on training in a culinary facility					
c. Online courses and webinars					
d. Onboard workshops and demonstrations					
e. Mentorship programs with experienced chefs					
f. Other (<i>specify</i>):					
14. What challenges do you encounter in ensuring the availability of healthy and nutritious food options onboard your ships? (Select all that apply)					
Cost-effectiveness of sourcing quality ingredients					
Compliance with regulations and standards					
Balancing crew preferences with nutritional needs					
Limited space for storage and preparation					
Other (please specify)					
15. What strategies do you employ or plan to implement to promote environmentally friendly practices in galley operations across your fleet? (Select all that apply)					
Investing in eco-friendly equipment and technology					
Providing crew training on sustainable practices					
Collaborating with suppliers to source sustainable ingredients					
Implementing waste management and recycling programs					
Other (please specify)					