ARTICLES

Evaluation and training on food safety practices in a food establishment in the city of Carmo do Paranaíba, MG, Brazil

Avaliação e treinamento sobre práticas de segurança alimentar em um estabelecimento alimentício na cidade de Carmo do Paranaíba, MG, Brasil

Evaluación y capacitación en prácticas de seguridad alimentaria en un establecimiento de alimentos en la ciudad de Carmo do Paranaíba, MG, Brasil

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Abstract: Food quality ensures hygienic and sanitary conditions to obtain a product free from contaminants while maintaining its sensory and nutritional characteristics. However, it is known that many establishments do not efficiently meet the requirements of specific legislation and require monitoring and actions to prevent contamination. The objective of this study was to evaluate the Good Manufacturing Practices (GMP) of a commercial establishment and to train employees involved in food handling. A structural check and monitoring of the activities of food handlers were carried out for 4 months. An initial assessment (diagnosis) was applied, showing a low level of adequacy, and then an action plan was drawn up to solve the problems detected. During the training, an improvement in compliance was obtained in all categories of the checklist (Resolution n. 216, 2004, Brazil). Microbiological analyses to assess hygiene procedures indicated compliance with some microbiological standards, but some sectors did not meet the recommended standards. The establishment under study improved its classification after the activities, which were fundamental for improving hygienic conditions. Still, it is possible to see that the actions need to be continuous for maintaining and improving food safety.

Keywords: food services; standard operating procedure; foodborne diseases; safe food.

Resumo: A qualidade dos alimentos envolve a garantia nas condições higiênico- sanitárias, a fim de se obter um produto isento de contaminantes e mantendo as características sensoriais e nutricionais. Sabe-se, porém, que muitos estabelecimentos não atendem de forma eficiente às exigências da legislação específica e precisam de monitoramento e ações para evitar as contaminações. O objetivo deste trabalho foi avaliar as Boas Práticas de Fabricação (BPF) de um estabelecimento comercial e treinar os colaboradores envolvidos na manipulação de alimentos. Realizou-se a verificação estrutural e acompanhamento das atividades dos manipuladores por um período dos 4 meses. Foi aplicada uma avaliação inicial (diagnóstico), apresentando baixo índice de adequação, e, em seguida, montou-se um plano de ação visando solucionar os problemas detectados. Durante os treinamentos, foi obtida uma melhoria de conformidades em todas as categorias do *checklist* (Resolução n. 216, 2004, Brasil). As análises microbiológicas de avaliação dos procedimentos de higienização indicaram atendimento de alguns padrões microbiológicos, porém alguns setores não atenderam os padrões recomendados. O estabelecimento em estudo melhorou sua classificação após as atividades, que foram fundamentais para melhoria das condições higiênicas, mas é possível perceber que as ações precisam ser contínuas para manutenção e melhoria da segurança alimentar.

Palavras-chave: serviços de alimentação; procedimento operacional padrão; doenças transmitidas por alimentos; alimento seguro.

Resumen: La calidad de los alimentos implica asegurar las condiciones higiénico-sanitarias, con el fin de obtener un producto libre de contaminantes y manteniendo sus características sensoriales y nutricionales. Se sabe, sin embargo, que muchos establecimientos no cumplen eficientemente los requisitos de una legislación específica y necesitan seguimiento y acciones para evitar la contaminación. El objetivo de este trabajo fue evaluar las Buenas Prácticas de Manufactura (BPM) de un establecimiento comercial y capacitar a los empleados involucrados en la manipulación de alimentos. La verificación estructural y el seguimiento

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de las actividades de los manipuladores se llevaron a cabo durante un período de 4 meses. Se realizó una evaluación inicial (diagnóstico), mostrando un bajo índice de adecuación, y luego se elaboró un plan de acción para solucionar los problemas detectados. Durante la capacitación se logró una mejora en el cumplimiento en todas las categorías de la lista de verificación (Resolución No. 216, 2004, BRASIL). Los análisis microbiológicos para evaluar los procedimientos de higiene indicaron el cumplimiento de algunas normas microbiológicas, pero algunos sectores no cumplieron con las normas recomendadas. El establecimiento en estudio mejoró su clasificación luego de las actividades que fueron fundamentales para mejorar las condiciones higiénicas, pero se puede ver que las acciones deben ser continuas, para mantener y mejorar la seguridad alimentaria.
Palabras clave: servicios de alimentación; procedimientos operativos estándar; enfermedades transmitidas por alimentos; comida segura.

1 INTRODUCTION

Food Services comprise all activities related to the preparation and handling of food outside the home environment, allowing these foods to be consumed anywhere. According to the Brazilian Association of Food Industries (ABIA, 2002), the food service sector is vast and is divided into two groups: public (or institutional) services and private services. Institutional services involve school canteens, and hospitals, among others. Private services include fast-food chains, bars, commercial restaurants, hotels, and collective meal companies.

Due to the COVID-19 pandemic, food services suffered some negative consequences, but delivery services kept the sector active (Martins, 2020). As noted, food services are becoming a good alternative boosting the economy, consequently creating job opportunities for the population. Food safety and quality are essential for the consumption of healthy foods and nutrients, and have an impact on the well-being of society. Food quality refers not only to its good appearance and texture, but also to its nutritional value and quality (Panebianco et al., 2022).

Resolution No. 216, of September 15, 2004 (Agência Nacional de Vigilância Sanitária [Anvisa]), with a national scope, aims to establish Good Practice procedures for food services, to guarantee the hygienic-sanitary conditions of the environment and food prepared (Anvisa, 2004). In Minas Gerais, Resolution SES/MG No. 6,362, of August 8, 2018, establishes the procedures for sanitary licensing and food handling. Within the municipality of Carmo do Paranaíba/MG, the legislation and requirements are described by Ordinary Law No. 951/1983 (Carmo do Paranaíba, 1983).

It is important to check health legislation through the checklist. By applying this tool, it is possible to analyze whether the requirements are being followed, and, if not, it will be possible to outline strategies to correct non-conformities. Therefore, the establishment will comply with current regulations, avoid contamination, and offer safe food. The objective of this study was to conduct a comprehensive assessment of Good Manufacturing Practices (GMP) in a commercial food establishment located in Carmo do Paranaíba, MG, with the aim of identifying and correcting deficiencies in food safety practices. In addition, the work aims to develop and implement a training program targeted at employees involved in food handling, with a focus on promoting compliance with relevant legislation and improving food hygiene and safety standards.

2. MATERIAL AND METHODS

2.1 Study location

The present study was developed in a food service located in the city of Carmo do Paranaíba, in Minas Gerais. The choice of location was based on specific criteria such as handling and

marketing of food products which, at the time of the study, did not have a technical manager. The selected establishment is private and has had a CNPJ and an operating license since 2014. It is open from 6:00 am to 7:00 pm to serve customers. Employees who handle food have two shifts, the first from 4:00 am to 12:00 pm, and the second from 7:00 am to 3:00 pm. From 3:00 pm to 7:00 pm there is no food handling in the establishment's kitchen, and during this shift previously prepared products are sold. The establishment's audience is diverse, with the majority being from the region, and the menu offered varies from party kits to various snacks and meals. There is a place in the space where food is displayed for sale and serves, on average, 150 people daily.

The person responsible for the establishment agreed to participate in the research and completed the authorization before the activities began. The research was approved (CAAE: 48414621.9.0000.5153) by the Research Ethics Committee of the Federal University of Viçosa (CEP-UFV) before starting activities on site. All handlers were informed of the objective and activities of this study and signed the ICF (free and informed consent form) indicating their consent to participate in the research.

2.2 Assessment and diagnosis

To evaluate the establishment, a conformity measurement instrument was used, which consists of a Good Manufacturing Practices (GMP) checklist prepared based on Resolution No. 216 (Anvisa, 2004). RDC 216 categorizes the evaluation criteria for Good Manufacturing Practices into groups that ensure compliance and effectiveness of the practices adopted in the food handling environment. The following are the criteria pertaining to the legislation and that were evaluated:

1) Buildings, facilities, equipment, furniture and utensils
2) Hygiene of facilities, equipment, furniture and utensils
3) Integrated control of vectors and urban pests
4) Water supply
5) Waste management
6) Handlers
7) Raw materials, ingredients and packaging
8) Food preparation
9) Storage and transportation of prepared food
10) Exposure to consumption of prepared food
11) Documentation and registration
12) Responsibility

The checklist was applied at different periods, before starting activities and after training on GMP, offered to handlers. The purpose of applying the checklist prior to the activities was to obtain a diagnosis of the location and enable the preparation of an action plan to improve the service. After the training, the checklist aimed to evaluate the effect of the activities developed on the team's behavior and learning, as well as the physical modifications to the location.

2.3 Action plan

The establishment was monitored for approximately 4 months, with fortnightly visits. Table 1 presents a summary of the activities carried out during each visit. The action plan was created

based on the results obtained after applying the 1st checklist, in order to meet the requirements of Resolution Nº 216 (Anvisa, 2004). During the visits, team behavior was observed to verify learning and monitor the progress of activities.

Table 1 – Activities developed.

Visit	Actions
1	- Presentation of the action plan
2	- Food Safety and FBD Training* - Team evaluation
3	- Food Handling Training - Team evaluation
4	- Food Labeling Training after opening - Team evaluation
5	- Vector and Pest Training - Team Assessment
6	- Training on hygiene of utensils and equipment and hygiene SOP* - Team Assessment - Carrying out swab sample collections (hands and equipment)
7	- Team Assessment - Performing the application of the latest checklist
8	- Application of Feedback
9	- Results presentation

Caption: *Foodborne disease (FBD); *Standard operating procedure.
Source: By the authors.

2.4 Microbiological analyzes

Microbiological analyses were used to verify whether food handlers perform hygiene correctly, minimizing food contamination. Swabs were collected from surfaces that came into contact with food at two stages: before training was applied and after training/supervised hygiene procedures. The collection points were: uniform, bathroom sink, room air, bathroom door handle, kitchen door latch, hair, sneeze, handlers' hands, bread machine, snack display, table, and board. For this collection, the swab technique was applied by swabbing the surface (Silva; Junqueira; Silveira, 2010).

For equipment and flat surfaces (bread machine, snack display, table, plastic board for cutting vegetables) a 100 cm2 mold was used to delimit the swab friction area. For the hands, the swab was applied to the entire dominant hand (right or left) of the handlers. For collection, the swab was immersed in a solution containing peptone water in a test tube, passed over the surface, returned to the tube, and then the tube was sealed and labeled. For some regions, such as the uniform, bathroom sink, bathroom door handle, and kitchen door latch, samples were collected by rubbing the swab on the surface, which was rubbed directly on the Petri dishes. For hair and sneezes, one of the handlers was asked to place strands of hair and sneezes on the culture medium. Ambient air was evaluated by simple sedimentation, with exposure to the culture medium for 15 min and 30 min, in the processing environment.

The tubes and plates containing the samples were kept refrigerated at 8ºC (Electrolux, DC 48, Brazil) and immediately taken for analysis at the Food Microbiology Laboratory at UFV-CRP. The samples were evaluated using the plating technique on Standard Counting Agar (PCA), for

mesophiles. The samples from the tubes were subjected to dilutions with subsequent inoculation of 0.1mL of the dilutions on plates containing the PCA medium. The plates were incubated (News Ethic, 411D, Brazil) at 35°C for a period of 48 hours. Plates that had 15 to 150 colonies were selected, and the results were expressed in CFU/hand, CFU/cm^2, CFU/utensil, or CFU/week/cm^2 (Apha, 2001; Silva; Junqueira; Silveira, 2010).

2.5 Preparation of educational/guiding materials

Posters were created containing the SOPs in an objective manner, in order to describe detailed instructions for the correct performance of routine hygiene operations in the production, storage, and transport of food. The posters that were made addressed the SOPs required by Resolution No. 216 (Anvisa, 2004).

2.6 Feedback

It is of great importance that the team of employees is engaged so that the procedures are carried out correctly. To check the team's engagement and assess their satisfaction with the activities carried out, a questionnaire was administered at the end of the activities. The questionnaire was administered anonymously so that employees felt free to express their opinions. The team delivered the questionnaire to employees, explained how to fill out the questions, and collected the answers after 7 days.

2.7 Data evaluation

The data obtained by the checklist were spreadsheets and separated by sectors: buildings and facilities; handlers; raw materials, ingredients, and packaging; equipment, furniture, and utensils; food preparation; storage and transportation of prepared food; exposure to consumption of prepared food; documentation and registration. For each sector, the percentage of compliant items was verified in each application of the checklist.

Microbiological analyses were evaluated based on the limits defined by the specific literature in the area. Data tabulation and graphs were performed using Excel®. The data were discussed descriptively and compared with the literature.

3. RESULTS AND DISCUSSIONS

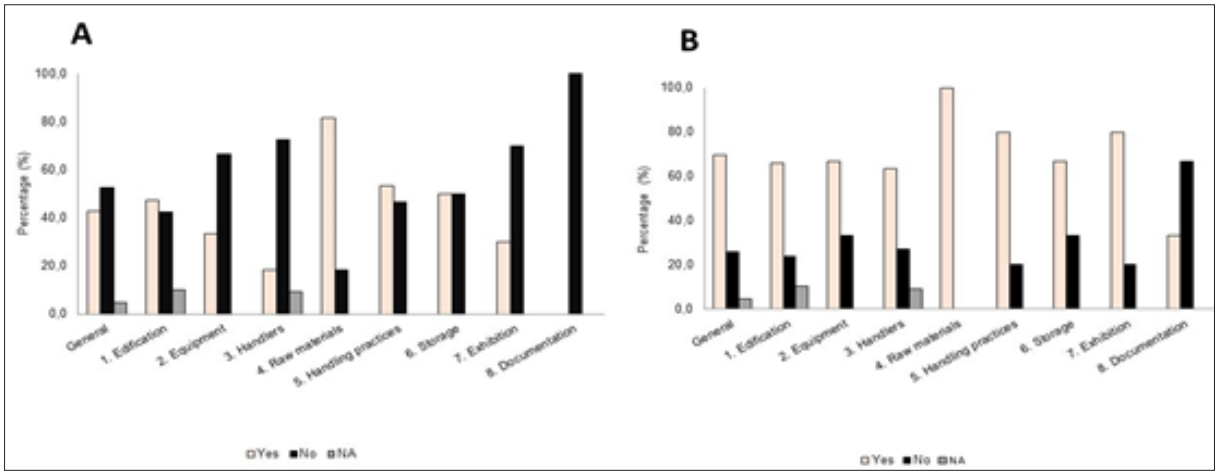
3.1 Assessment and Diagnosis

The results obtained by the first checklist provided us with information about the initial situation of the establishment in Figure 1A and Figure 1B shows the results of the checklist carried out after 4 months of activities. After applying the first checklist, it was possible to observe that all categories presented a low adequacy index and, through this diagnostic analysis, a worrying Brazilian reality was confirmed, which is that not all food establishments use GMP.

The results in Figure 1A show that all sectors needed improvements, as they presented high rates of non-conformities (more than 40% of non-conformities, for most sectors). Four categories showed high rates of non-conformities (>50%) (Figure 1A), highlighting the need for further adjustments. The most critical sectors were Equipment, Manipulators, Exhibition and

Documentation. The others (Building, Storage, and Handling) presented between 40-50% of non-conforming items, which also required attention and correction. Only the Raw Materials item presented a satisfactory value, with less than 25% of non-conforming items.

Figure 1 – Results in percentage of the checklist carried out on the first visit (diagnosis) (A). Results in percentage of the checklist carried out at the end of the activities (B). Compliances (yes); Unconformities (no); Not applicable (NA)



Source: By the authors.

It was possible to verify the situation of the production sector, showing that it is not sanitized during work and has residue on the floor and clothes scattered around, making it possible to notice: disorganization, clothes in the handling sectors, products exposed for sale uncovered, cleaning materials outside the places, food products along with cleaning materials, hand washing sink with mats.

The Equipment and Utensils category presented several non-conformities, highlighting equipment that is difficult to clean and does not carry out periodic calibration. The utensils used in the establishment are made of porous material, which does not allow for good hygiene and can be a source of contamination. The food preparation environment was inappropriate, and hygiene and manufacturing rules were not followed (poorly cleaned kitchen equipment). This situation would promote the development of pathogenic microorganisms that could subsequently contaminate food and make it unfit for consumption (Toe et al., 2018; Komagbe et al., 2019). In the Handlers category, only one item was in compliance, which was the removal of handlers who had injuries and/or symptoms of illness. Handlers did not receive periodic training, which made it difficult for them to master and understand the procedures carried out in the establishment. With this, we note the need to change the habits and behavior of employees. It is clear how important it is to train handlers so that the risks of contamination in the product can be minimized. Abdisa et al. (2024) evaluated that for handlers who had food safety training to apply in food services, the implementation of good food safety practices was 6.05 times greater than those who did not have food safety training. Unsafe food handling procedures by handlers can result in food contamination, which can lead to foodborne illnesses in consumers (Trafialek et al., 2018).

In the Food Handling category, it is observed that 53.3% are in accordance with what the legislation recommends. However, the other non-compliant items showed that the handlers

carried out practices that are a source of cross-contamination and that the temperatures of thermal and storage procedures were not monitored. These flaws can be easily remedied, for example, by using portable thermometers to monitor food preparation and record. A positive attitude towards by food handlers in food safety practices through training during food handling is a potential factor in reducing the risk of foodborne illnesses in food facilities (Tomaszewska et al., 2018). The knowledge of food handlers is an important predictor of their involvement in participating in hygienic food handling practices (Mullan; Wong; Kothe, 2013).

In the category of raw materials, ingredients, and packaging, it was observed that 81.1% were in compliance. In the Storage category, it was observed that 50% of the items were in compliance. We observed that transportation and storage are not carried out under adequate time and temperature conditions, which may compromise the integrity of the food. In the category of Exposure to the consumption of prepared food, 70% of the items were non-compliant. This showed us that it was necessary to change the routine in some areas, such as organizing and cleaning the prepared food display area and frequently monitoring the temperature of the equipment.

In the Documentation and Registration category, we saw that 100% of the items were non-compliant, that is, there is no GMP, SOP, or records implemented in the establishment. SOPs are extremely important to ensure food safety, with standardization of the processes carried out, with the aim of improving production quality (Frederico; Oliveira, 2022). Through them, together with records, it is possible to obtain greater production control and meet legislative standards, guaranteeing food fit for consumption.

After surveying conformities and non-conformities, an action plan was drawn up (Table 1), including training and guidance on corrective measures. During the 4 months of activities, it was possible to start implementing the GMP and verify improvements on site (Figure 1B). It was possible to notice that most sectors had more than 60% of compliance, and only the documentation criterion continued to have a high rate of non-compliance (>65%). The training conducted for handlers was short (approx. 20 min), and whenever possible, dynamics and practical examples were used in order to improve the team's understanding and engagement. The visits were carried out without a fixed day of the week, so that it was possible to evaluate the application of the subjects covered in the training, and verify what was being accomplished.

With the improvements found after the activities, the importance of quality tools is reinforced so that more hygienic products can be obtained. An essential aspect of food safety focuses mainly on the food handler's food safety practices and training in the processes that directly involve the storage, preparation and cooking of food (World Health Organization, 2019).

For a better visualization of the evolution of the establishment, a comparison was made of the criteria in compliance found at the beginning (Checklist 1) and after the activities (Checklist 2) (Table 2) and it is noted that all sectors showed improvements, where the differences in all criteria were positive, indicating increased compliance.

Table 2 – Comparison of checklist items that were in compliance between visits.

Evaluation Criteria	Compliances (%)		
	Checklist 1	*Checklist* 2	**Difference**
General	42,9	69,5	26,6
1. Building and facilities	47,5	66,1	18,6
2. Equipment, furniture and utensils	33,3	66,7	33,3
3. Conduct of Handlers	18,2	63,6	45,5
4. Raw materials, ingredients and packaging	81,8	100,0	18,2
5. Food preparation	53,3	80,0	26,7
6. Storage and transportations	50,0	66,7	16,7
7. Exposure to the consumption of prepared food	30,0	80,0	50,0
8. Documentation and registration	0,0	33,3	33,3

Source: By the authors.

Considering compliance in general, it was observed that the establishment, before the activities, fell into Group 3 (up to 50% compliance) by Resolution No. 216 (Anvisa, 2004), and at the end of the activities, it reached 69.5% of compliance, categorizing it in Group 2 (51-75% compliance). This category improvement was the result of an increase in compliance in all categories, which now presented compliance greater than 63%, with the exception of the documentation item.

In the Building and facilities category, there was an increase in the compliance rate (66.1% compliance), however, one point in which there was still no adequacy regarding GMP was the ventilation of the food handling area. According to Oliveira et al. (2004), the lack of ventilation generates thermal discomfort, which impairs the execution of work in addition to causing discomfort in the employee, reducing production, and also the production of sweat, which is a possible source of contamination. Furthermore, poor ventilation can compromise the hygienic and sanitary quality of the food produced.

It was noted that the behavior of food handlers and exposure to food consumption showed greater increases (greater differences between visits) of 45.5% and 50.0% respectively, showing that the training was effective. There is a need to address the importance of food safety in foodservice, particularly personal hygiene as a component of an effective training program. Data from the FDA in 2023 showed that 83% of full-service restaurants and 67% of fast-food restaurants were out of compliance due to poor personal hygiene. When handwashing practices were observed, 82% of full-service restaurants and 66% of fast-food restaurants were found to be out of compliance based on observational data collected over 5 years (U.S. Food and Drug Administration, 2023). By applying corrective measures, those responsible can guarantee food free from microbial contamination, reinforcing its quality and microbiological safety, adapting it to consumption in accordance with current legislation (Oliveira et al., 2024).

It was observed that the raw materials sector had a total of 100% of items in compliance, indicating that the action plan outlined was put into practice, through simple actions, such as: Organizing storage in an appropriate and clean location, using First-in-first-out fermentation is the first-out process, separating foods with failed batches or those with an expired expiration date and being immediately returned to the supplier or duly identified and stored separately, improving inspection upon arrival of goods, among others.

We can see that in the Documentation category, there was an improvement of only 33.3% compared to the first checklist. The establishment did not have any type of record of documentation relating to GMP, and the time of 4 months was not enough to meet all the requirements, but if action is continued, these are items that can be easily resolved, such as the formulation in the good practice manual, training records and records of established SOPs. The need to maintain GMP activities and employee training is highlighted to maintain product quality and the improvements already achieved in all categories (obtained after training and adjustments to the establishment).

3.2 Microbiological analyzes

Swab collection from surfaces that come into contact with food was carried out in two moments and the results for determining mesophiles are in Table 3.

Table 3 – Assessment of hygiene of hands, surfaces, and ambient air, collected during the visit.

Evaluate Region	Before the hygiene process	After training and supervised hygiene process
Hand (CFU/hand)		
Handlers 1	$3,5 \times 10^4$	$3,0 \times 10^4$
Handlers 2	$1,1 \times 10^6$	$1,0 \times 10^3$
Handlers 3	$4,2 \times 10^4$	$5,8 \times 10^4$
Surface (CFU/cm^2)		
Bread machine	$1,4 \times 10^2$	0
Savory display	0	0
Table	3×10^2	0
Plastic cutting board (for vegetables)	$1,3 \times 10^4$	$1,7 \times 10^3$
Kitchen air (CFU/week/cm^2)	$4,2 \times 10^2$	NC
Items others (CFU/object)		
Uniform	+300	NC
Bathroom sink	16	NC
Bathroom door handle	2	NC
Latch (kitchen door)	18	NC
Hair	10	NC
Sneeze	0	NC

NC = Not carried out. Recommendation, according to Brazilian research (Andrade, 2008): Hands: 1.2 x 104 CFU/hand; Surfaces: 1 x 102 CFU/cm2 or CFU/small utensil; Ambient air: 1 x 102 CFU/week/cm^2
Source: By the authors.

The hygienic condition of handlers and equipment surfaces is essential to avoid microbiological contamination and thus guarantee the integrity of consumer health. After the training, it was possible to observe that the handlers' practices within the establishment improved, as conditions at some collection points improved after the training (Table 4). For efficient cleaning, it is necessary to first clean the surface, removing all organic matter. Equipment and utensils containing food residue reduce the efficiency of cleaning and sanitation, in addition to promoting microbiological multiplication (International Commision on Microbiological Specifications for Foods [ICMSF], 2015).

Analyzing Table 4, it was noticed that the hands of all handlers before the hygiene process were outside acceptable standards, indicating that the previous hygiene procedure was not carried out correctly, or that the interval between hygiene and food handling was not satisfactory. Ideally, handlers should have the habit of washing their hands regularly during their activities, so that food hygiene and safety can be guaranteed throughout the working day. Even after training, some handlers (1 and 3) had mesophilic counts above those recommended for newly sanitized hands, and even handler 3 had a higher count after hygiene than before the hygiene process. This shows that handlers, even if already trained, need refresher training (new training) and supervision (evaluation) of their behavior. Another aspect that needs to be taken into consideration is the quality of the products used, checking whether the soap and antiseptic agent are of good origin and are being applied at the correct dilution and time, to ensure their efficiency.

Handler 2, despite having presented the highest count before hygiene, was the only one who presented a hand mesophilic count within the appropriate microbiological standards, immediately after the hygiene process. This demonstrates that the products used were efficient and that the procedure was carried out correctly. Hand hygiene among food handlers is the most basic critical criterion in safe food handling (El-Nemr et al., 2019). This corroborates the data, where even after training and supervision of the activity, the handlers' hands were still the item with the most non-compliance. Tartler and Fortuna (2012) evaluated the microbiological quality of food handlers' hands and gloves and obtained a high level of contamination by total and thermotolerant coliforms.

When analyzing the surfaces after training, it was observed that the bread machine, the snack display, and the table had counts within the established limits, indicating that the hygiene process was efficient and well carried out. Through the results of the microbiological analysis, it is clear that the food handlers correctly sanitized this equipment, minimizing food contamination. The plastic board used to cut vegetables presented values outside the recommended standard (1 x 102 CFU/cm2), before and after the hygiene process. As the board had a high count, the utensils must be inspected and the hygiene process must be reviewed.

The ambient air in the kitchen presented a value of 4.2 x 102 CFU/week/cm2, a value above the recommended value. To improve the quality of the processing air, spraying sanitizing solutions can be used twice a week in the environment. Andrade (2008) reported that spraying chlorinated solutions (100 mg.L-1), twice a week for 1 month, reduced the air in food processing areas to acceptable levels (1.0x102 CFU.cm2.week). A micro dairy industry.

The uniform, even though it appeared visibly clean, received a high score. The swab was collected in the middle of the working day and the area of the uniform analyzed was close to the belly, as it is close to the counter and closer to the food, indicating a risk of contamination. As the uniform cannot be a source of contamination throughout the working day, the results indicate that the handler should change it more frequently, with it being recommended to change it daily or whenever necessary. Food and surface recontamination is largely associated with poor hygiene practices, such as handling food waste or taking a break outside the handling environment while wearing uniforms (Zenbaba et al., 2022).

The hair is counted, so it must always be tied with a cap appropriate for this purpose (Anvisa, 2004). The sneeze was surprising, as it did not show a count, this could be due to the good health of the handler, or because he felt embarrassed and did not sneeze with a large amount of saliva. According to Resolution Nº 216 (Anvisa, 2004), it is important for food handlers

to maintain the habit of not singing, whistling, coughing, or sneezing, among others, on food, to avoid contamination (Anvisa, 2004).

The importance of training and the application of Good Manufacturing Practices (GMP) in food services is extremely important, as they comprise a set of practices and procedures for the correct handling and preparation of food, ensuring a reduction in risks and better control quality within establishments according to Lopes et al. (2020) in their studies.

3.3 Educational/guiding materials

To help and facilitate handlers' understanding and awareness of hygiene, posters were created and posted in the production environment. The posters made addressed some SOPs required by Resolution Nº 216 (Anvisa, 2004). According to legislation, the use of posters explaining how to correct hand hygiene and antisepsis are carried out is of great importance, which contributes to the prevention of food contamination. Posters for the hygiene of hands, handlers, and the work environment were placed near the sinks and in visible locations following the recommendation of legislation Resolution 216 (Anvisa, 2004), thus facilitating viewing by handlers when carrying out this procedure.

3.4 Feedback

At the end of the activities, the handlers filled out feedback evaluating the work carried out, and the results can be seen in Table 4.

The activity developed by the team was well evaluated by employees, and none of the evaluated criteria received a negative evaluation (Indifferent, dissatisfied, or very dissatisfied). According to Table 4, all employees were satisfied with the content provided and indicated how important the content covered was for improving activities aimed at hygienic quality. In general, they considered training to be important, showing satisfaction with the new knowledge acquired over the 4-month period and that they would recommend training. The feedback results demonstrate that the objective of providing quality information to employees was met and that they considered the content relevant. This can be an indication of who will retain learning and follow past guidance. However, as seen in the results section, continuous action (training and supervision) is necessary to truly change habits and improve the establishment's food safety results.

Table 4 – Feedback results

	Evaluated Criteria	Absolute frequency		Relative frequency (%)	
		Satisfied	Very satisfied	Satisfied	Very satisfied
Contents covered	The duration was adequate	1	4	20%	80%
	There was good organization	–	5	–	100%
	The level of information was adequate for the proposed objectives	1	4	20%	80%
	The contents were explained clearly	2	3	40%	60%
	The language used was appropriate	–	5	–	100%
	Content is important for your work	–	5	–	100%

Evaluated Criteria	Absolute frequency		Relative frequency (%)	
	Satisfied	Very satisfied	Satisfied	Very satisfied
Learned new content	–	5	–	100%
Would you recommend training	–	5	–	100%

Number of participants: 5; There were no evaluation criteria such as Indifferent, dissatisfied or very dissatisfied.
Source: By the authors.

4 CONCLUSION

The activity developed by the team was well evaluated by employees, and none of the evaluated criteria received a negative evaluation (Indifferent, dissatisfied, or very dissatisfied). According to Table 4, all employees were satisfied with the content provided and indicated how important the content covered was for improving activities aimed at hygienic quality. In general, they considered training to be important, showing satisfaction with the new knowledge acquired over the 4-month period and that they would recommend training. The feedback results demonstrate that the objective of providing quality information to employees was met and that they considered the content relevant. This can be an indication of who will retain learning and follow past guidance. However, as seen in the results section, continuous action (training and supervision) is necessary to truly change habits and improve the establishment's food safety results.

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