

IDENTIFICATION OF OCCUPATIONAL HEALTH AND SAFETY AREAS SUPPORTING THE DEVELOPMENT OF A CULTURE OF FOOD QUALITY AND SAFETY

Justyna GÓRNA^{1*}, Joanna SADŁOWSKA-WRZESIŃSKA²

¹ Poznań University of Economics and Business; justyna.gorna@ue.poznan.pl, ORCID: 0000-0002-2763-5810

² Poznań University of Technology; joanna.sadlowska-wrzesinska@put.poznan.pl,
ORCID: 0000-0003-1335-6738

* Correspondence author

Purpose: The aim of the article is to identify areas of occupational health and safety that can support the development of a culture of food quality and safety.

Design/ methodology / approach: A study was conducted in the surveyed enterprise to determine the level of food quality and safety culture, and then to assess the possibility of using the occupational health and safety system in terms of the possibility of developing solutions supporting the development of food quality and safety culture.

Findings: Key areas have been identified, such as training, hygiene, risk and crisis management, work ergonomics, communication and reporting, and supervision of chemical agents, which can mutually positively influence the culture of occupational health and safety and food quality and safety.

Originality / value: The article presents an assessment of the level of food quality and safety culture in the surveyed enterprise. Common areas in the field of occupational health and safety culture were also identified, which can strengthen the development of food quality and safety culture. The article can be an element influencing the improvement of activities in the discussed areas in other enterprises, which can contribute to the development of their food quality and safety culture.

Keywords: food quality and safety culture, occupational health and safety culture, development and improvement.

Category of the paper: Case study.

1. Introduction

Safety is a key element of broadly understood quality of life – quality of the economic entity, quality of products and services, quality of processes, quality of interpersonal and inter-organizational relations, quality of infrastructure and others. All these aspects allow specific groups of stakeholders to function with a sense of certainty, peace and lack of threat (Wiśniewska, Grudowski, 2019). Quality culture – and in a broader context, culture of excellence – can be treated as a set of various subcultures influencing the functioning of the organization, especially in the aspect of its pro-quality strategy. Therefore, if we assume that the most important feature of quality is safety, then it will be equally important – within the culture of excellence – to shape a culture of safety (Sadłowska-Wrzesińska, 2023). Shaping a culture of safety requires constant focus not only on the behavior of employees, but also on the physical work environment (technology, equipment, procedures) and individual characteristics of employees (skills, predispositions, experience). It is therefore not surprising that at the level of operational activities, enterprises expect specific guidelines that will help them design and then implement the concept of occupational health and safety culture (Sadłowska-Wrzesińska, 2018).

Griffith et al. (2010) have long pointed out that the concept of workplace culture influencing employee behavior in the food industry has been largely ignored, while it has been studied in many other industries (e.g. aviation, nuclear industry, etc.). Many industries around the world are interested in safety culture as a way to reduce the risk of disasters and accidents. Griffith et al. noted the need for more detailed research on food safety culture, as the concept and its importance were poorly understood at all levels of management in the food industry (2010). The importance of food safety culture has finally been recognized and emphasized in legal requirements. The 2020 update of the Codex Alimentarius was the reason for introducing a change through Commission Regulation (EU) 2021/382 to the content of Regulation (EC) No 853/2004 on food safety culture. The Codex Alimentarius Commission has determined that food safety culture increases food safety by increasing awareness and improving employee behavior in food establishments (Regulation 2021/382). The law does not define food safety culture, but specifies the obligations of food businesses in this area. The definition of this concept can be found in the so-called private standards, which extend the spectrum of food safety culture to include quality. An overview of the concepts and obligations related to this issue is presented in Table 1.

Table 1.*Food safety culture requirements based on selected standards*

Standards	Requirements of food safety culture
Commission Regulation (EU) 2021/382 of 3 March 2021 amending the Annexes to Regulation (EC) No 853/2004 of the European Parliament and of the Council on the hygiene of foodstuffs as regards food allergen management, redistribution of food and food safety culture	<ol style="list-style-type: none"> 1. Food business operators shall establish, maintain and provide evidence of an appropriate food safety culture by fulfilling the following requirements: <ol style="list-style-type: none"> a) commitment of the management, in accordance with point 2, and all employees to the safe production and distribution of food; b) leadership towards the production of safe food and to engage all employees in food safety practices; c) awareness of food safety hazards and of the importance of food safety and hygiene by all employees in the business; d) open and clear communication between all employees in the business, within an activity and between consecutive activities, including communication of deviations and expectations; e) availability of sufficient resources to ensure the safe and hygienic handling of food. 2. Management commitment shall include: <ol style="list-style-type: none"> a) ensuring that roles and responsibilities are clearly communicated within each activity of the food business; b) maintaining the integrity of the food hygiene system when changes are planned and implemented; c) verifying that controls are being performed timely and efficiently and documentation is up to date; d) ensuring that the appropriate training and supervision are in place for personnel; e) ensuring compliance with relevant regulatory requirements; f) encouraging continual improvement of the food safety management system of the business, where appropriate, taking into account developments in science, technology and best practices. 3. The implementation of the food safety culture shall take account of the nature and size of the food business.'
IFS Food version 8, 2023	<p>Definition food safety culture: Shared values, beliefs and norms that affect mindset and behavior toward food safety in, across and throughout an organization. Elements of food safety culture are those elements of the food safety management which the senior management of a company may use to drive the food safety culture within the company.</p> <p>These shall include, at a minimum:</p> <ul style="list-style-type: none"> • Communication about food safety policies and responsibilities. • Training. • Employee feedback on food safety related issues. • Performance measurement. <p>Requirements-point. 1.1.1: The senior management shall develop, implement and maintain a corporate policy, which shall include, at a minimum:</p> <ul style="list-style-type: none"> • food safety, product quality, legality and authenticity • customer focus • food safety culture • sustainability. <p>This corporate policy shall be communicated to all employees and shall be broken down into specific objectives for the relevant departments. Objectives about food safety culture shall include, at a minimum, communication about food safety policies and responsibilities, training, employee feedback on food safety related issues and performance measurement.</p>

Cont. table 1.

BRC Global Standard Food Safety Issue 9, 2022	<p>Definition food safety and quality culture: The attitudes, values and/or which beliefs are prevalent at the site, relating to the importance of product safety and the confidence in the product safety systems, processes and procedures used by the site.</p> <p>Requirements - point. 1.1.2: The site's senior management shall define and maintain a clear plan for the development and continuing improvement of a food safety and quality culture. The plan shall include measures needed to achieve a positive culture change. This shall include:</p> <ul style="list-style-type: none"> • defined activities involving all sections of the site that have an impact on product safety. <p>As a minimum, these activities shall be designed around:</p> <ul style="list-style-type: none"> • clear and open communication on product safety, • training, • feedback from employees, • the behaviors required to maintain and improve product safety processes, • performance measurement of activities related to the safety, authenticity, legality and quality of products, • an action plan indicating how the activities will be undertaken and measured, and the intended timescales, • a review of the effectiveness of completed activities. <p>The plan shall be reviewed and updated at least annually, at a minimum.</p>
---	---

Source: Regulation 2021/382, BRC, IFS.

When analysing the presented requirements of standards and EU law, certain common features can be noticed, namely references to the need to:

- ensuring open and clear communication with employees regarding food safety,
- providing training to employees.

However, legal requirements do not specify how to implement a food safety culture in an enterprise, but only specify that the nature and size of the enterprise should be taken into account when implementing it. In turn, in the requirements of private standards, we will find suggestions on how to build a plan for the development of a food quality and safety culture in an enterprise, and above all, how to measure its effectiveness. The basic thing is to measure the current state, i.e. assess the current level of culture in the enterprise and plan further actions on this basis.

Understanding and measuring the culture of food quality and safety is extremely important – it is a key success factor for any food company (Emond, Taylor, 2018; Nyarugwe et al., 2016). Increasing attention is being paid to employee behavior and such significant elements of food safety culture as leadership, commitment, communication, risk awareness, work environment, and management system (Zanin et al., 2021).

2. Measuring the culture of food quality and safety in an enterprise

The company where the survey was conducted in 2024 is located in Poland and is involved in the production of ready meals. It belongs to the medium-sized enterprise sector. The survey aimed at assessing the culture of quality and food safety was conducted using:

- a self-assessment questionnaire on the culture of excellence, which was addressed to management staff (Table 2),
- food safety culture self-assessment questionnaire, which was dedicated to production workers (Table 3).

Table 2.
Culture of Excellence Self-Assessment Questionnaire

	1. NO I definitely don't agree	2. NO I don't agree	3. And so, and NO	4. I agree	5. I absolutely agree	
	Strategic leadership	1	2	3	4	5
1	Top management creates strategy with an emphasis on improving products/services.					
2	Top management creates conditions in which all employees identify with the idea of continuous improvement.					
3	Top management actively promotes and communicates the concept of continuous improvement.					
4	Top management treats its employees as strategic resources deserving of development.					
	Customer focus	1	2	3	4	5
5	All employees demonstrate excellence in meeting customer needs every day.					
6	The organization strives to continually improve its ability to meet customer needs.					
7	The results of the customer satisfaction measurement prove that the organization is continuously improving its ability to meet customer needs.					
	Engagement of the employees	1	2	3	4	5
8	Every day, employees are eager to introduce improvements and innovations in their workplace.					
9	Every day, employees are eager to share their ideas for improvement.					
10	Employees are eager to participate in improving their qualifications.					
11	Employees are interested in how the results of their work contribute to the improvement of the organization.					
	Human resources management	1	2	3	4	5
12	Employee recruitment is based on the principle of "the best man in the right place".					
13	The best employees and their talents are appreciated and supported within the organization.					
14	The organization nurtures student-master relationships.					
15	The promotion system in the organization is based on the criterion of excellence, from the perspective of the results achieved in a given position.					
16	The organization ensures good communication between employees in order to introduce ideas for improvement.					
	Management processes	1	2	3	4	5
17	Goals are established for processes that take into account the highest standards of performance.					
18	Excellence in work performance is a fundamental principle of functioning in an organization.					
19	The processes are monitored on an ongoing basis to assess compliance with adopted standards.					
20	Employees do not allow any deviations from the accepted standards.					
21	Processes are continually improved taking into account the best available technologies.					
22	There are no errors in the process.					

Cont. table 2.

Continuous improvement and learning		1	2	3	4	5
23	There is a belief within the organization that continuous improvement pays off.					
24	The organization allocates resources for continuous improvement.					
25	The organization uses continuous improvement methods and techniques.					
26	The organization involves its suppliers and partners in the process of continuous improvement.					
27	Continuous improvement efforts produce measurable results.					
28	Education and training at all levels is a priority in the organization.					
Good practices production		1	2	3	4	5
29	The organization practices ongoing modeling on good manufacturing practices from outside the enterprise.					
30	The organization practices ongoing modeling on good manufacturing practices from within the company.					
31	Actions towards good manufacturing practices bring tangible results.					
Power of attorney and Work team		1	2	3	4	5
32	Employees are always encouraged to submit ideas for improvement.					
33	Employee ideas for improvement will certainly be considered.					
34	Employees are aware of their influence on improvement in the organization.					
35	Employees receive full support when they propose specific improvements, either as a team or individually.					
36	Employees are encouraged to work as a team.					
Creativity and innovations		1	2	3	4	5
37	The organization rewards employees for their creativity.					
38	The organization constantly monitors various innovations that may affect it.					
39	The organization cooperates with various research and development institutions.					
40	Innovations of various nature are introduced on an ongoing basis within the organization.					

Source: Wiśniewska, Grudowski, 2019.

Table 3.*Food Safety Culture Self-Assessment Questionnaire*

1 – Definitely YES 7 – definitely NO								
Support management and co-workers		1	2	3	4	5	6	7
1	Management inspires me to follow food safety and quality practices.							
2	My manager actively ensures that food safety and quality practices are followed.							
3	There is good cooperation between departments, ensuring that the consumer receives food prepared in a safe manner.							
4	New employees and experienced employees work together to implement good manufacturing and hygiene practices in the field of food safety and quality.							
5	Management consistently enforces food safety and quality policies among all employees.							
6	When work needs to be done quickly, employees work together as a team to ensure tasks are completed safely.							
7	My manager always ensures that employees follow safe food handling practices.							
8	My colleagues always support each other in implementing good manufacturing and hygiene practices for food safety and quality.							
9	All employees remind each other to follow good manufacturing and hygiene practices regarding food safety and quality.							
10	Employees are disciplined and reprimanded if they do not follow good manufacturing and hygiene practices regarding food safety and quality.							

Cont. table 3.

	Communication	1	2	3	4	5	6	7
11	I can speak up freely if I see something that may impact food safety and quality.							
12	My manager provides instructions on food safety and quality.							
13	All necessary information regarding safe food handling is available at my workstation.							
14	Management provides timely and accurate information on current food safety policies and laws.							
15	I am encouraged to provide suggestions on how to improve good manufacturing and hygiene practices for food safety and quality.							
16	All managers provide consistent messaging about food safety and quality.							
	Self-commitment	1	2	3	4	5	6	7
17	I follow food safety and quality rules because it is my responsibility.							
18	Food safety and quality are a high priority for me.							
19	I follow food safety and quality rules because I think they are important.							
20	I am committed to food safety and quality.							
21	I keep my workstation clean because I don't like mess.							
	Support Environment work	1	2	3	4	5	6	7
22	Required equipment for safe food preparation is available and accessible (e.g. hand washing sinks).							
23	Adequate resources are readily available to enable safe food handling.							
24	The equipment is of appropriate quality to enable safe food processing practices.							
25	I am equipped with appropriate resources to easily comply with good manufacturing and hygiene practices in the safe handling of food.							
	Pressure work	1	2	3	4	5	6	7
26	The workload does not affect my ability to follow good manufacturing and hygiene practices in the safe handling of food.							
27	I always have enough time to follow good manufacturing and hygiene practices in safe food handling, even in a rushed situation.							
28	The number of workers assigned to a given shift is adequate to enable me to do my job properly and ensure safe food handling.							
	Risk assessment	1	2	3	4	5	6	7
29	I am convinced that documented policies and procedures are nothing more than a cover-up in the event of a lawsuit.							
30	Sometimes I am asked to "cut corners" so that we can save on food production costs.							
31	When there is pressure to complete production on schedule, sometimes managers tell us to work faster, "cutting corners" on food safety and quality.							

Source: Wiśniewska, Grudowski, 2019.

The study covered 26 management staff and 101 production workers, which together constituted 50.8% of the entire population. The average assessment of the results of the study conducted on a group of 101 people among production workers in individual areas is presented in Figure 1.

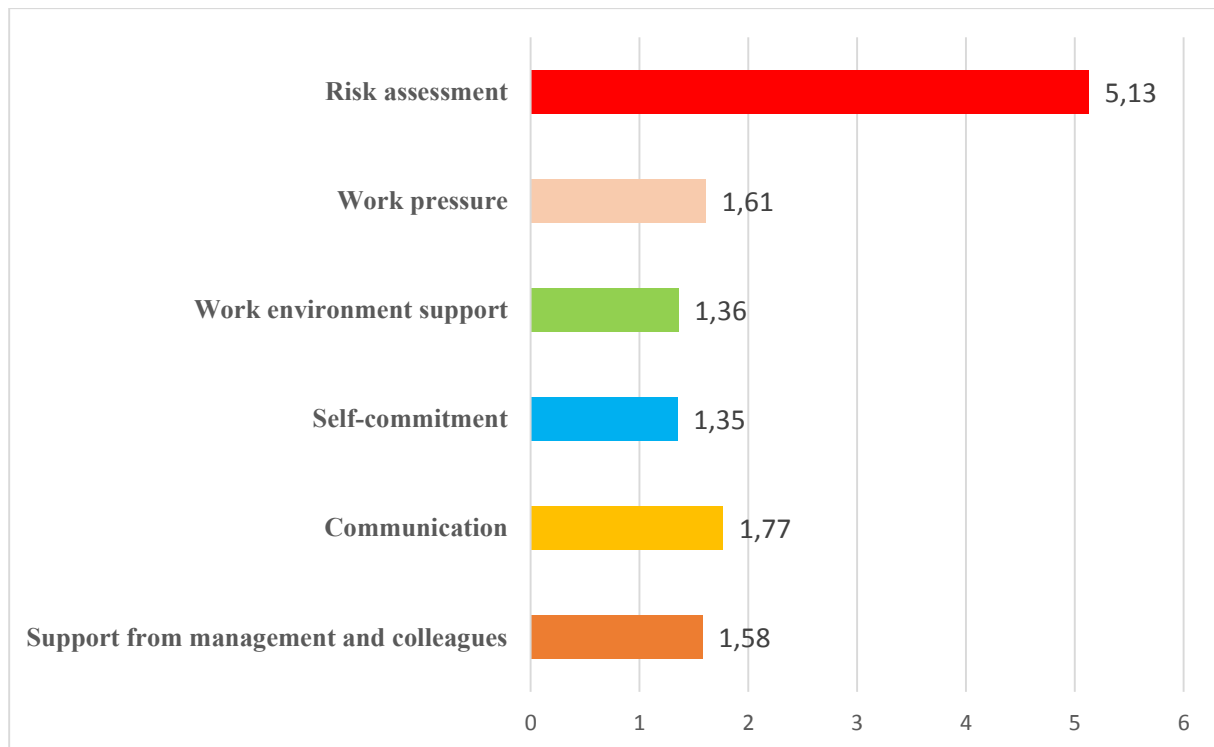


Figure 1. Assessment of food quality and safety culture – production workers (average results).

Source: Own research.

For the adopted criteria such as: management support, communication, self-commitment, work environment support, work pressure, the obtained results are satisfactory. Employees confirmed that they receive support from management and co-workers in terms of support in the implementation of good production and hygiene practices and that they work as a team for safe production in terms of ensuring the safety of manufactured products. In addition, the studies confirmed that employees are disciplined and reprimanded if they do not follow good practices. The study confirmed effective communication among employees and that they have the necessary instructions at their workstation. In addition, employees are encouraged to provide suggestions on improving good production and hygiene practices in terms of product quality and safety. The area of **"self-commitment"** and **"work environment support"** were **rated very high**. Employees rated partial statements (statements 17-21) in terms of their involvement in the implementation of GMP/GHP at a level of 1.32 to 1.37. The infrastructure was rated equally high (statements from 22 to 25), employees have access to equipment ensuring hygiene, the devices they use are properly maintained and of appropriate quality. The next area of the study concerned the opinions of employees regarding the assessment of **"work pressure"**, employees assessed that the number of employees per shift is appropriate for the work they do properly and they always have time to comply with GMP/GHP requirements. The last area of the study concerned **"risk assessment"**, in this area there are 3 statements (Figure 2).

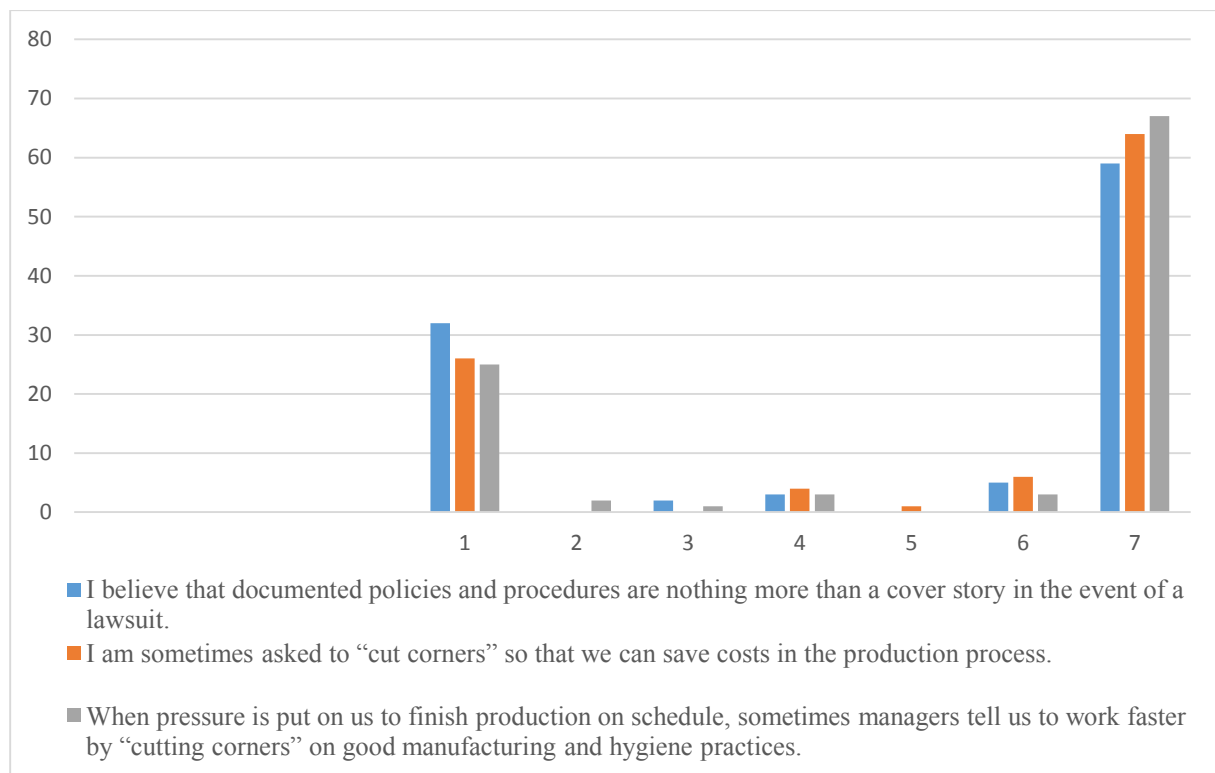


Figure 2. Risk assessment - measurement of food quality and safety culture among production workers (where 1 - definitely YES; 7 - definitely NO).

Source: Own research.

The analysis of responses in this area indicates that the largest percentage of employees (30%) believe that the procedures are in place to ensure that the company does not have problems in the event of a court case and that it is acceptable to violate GMP/GHP rules in the event of a situation involving time pressure (25% of respondents). It is particularly worrying that employees indicate that they are encouraged by their managers to break GMP/GHP rules in situations involving time pressure. The company under review should plan actions aimed at, among others, eliminating such a feeling in the scope of the above issues among employees and strengthening actions in the scope of improving the awareness of the management staff.

The average results of the survey conducted on a group of 26 people among management staff in individual areas are presented in Figure 3.

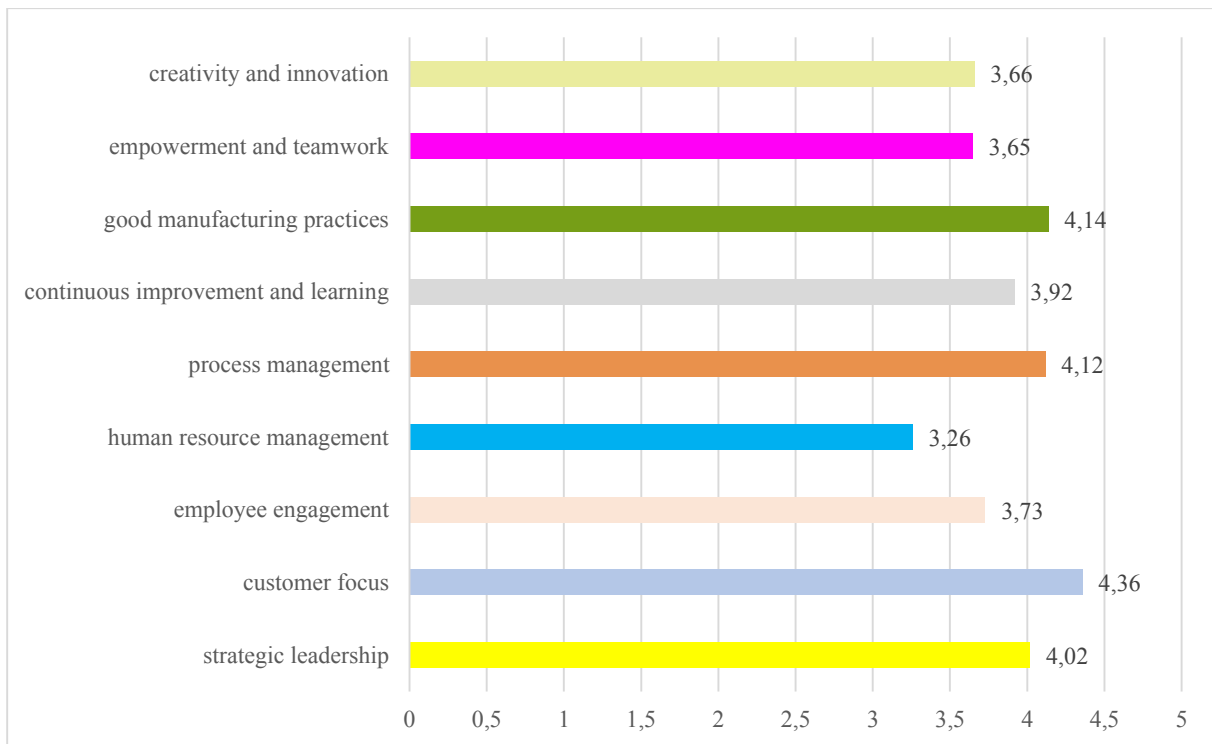


Figure 3. Assessment of the culture of excellence – management staff (average scores).

Source: Own research.

The average results achieved in the areas studied can be considered satisfactory. Only the area of "**human resources management**" was rated the lowest (3.26). Analyzing the distribution of responses (Figure 4) in this area, it can be seen that employees rated two statements the lowest.

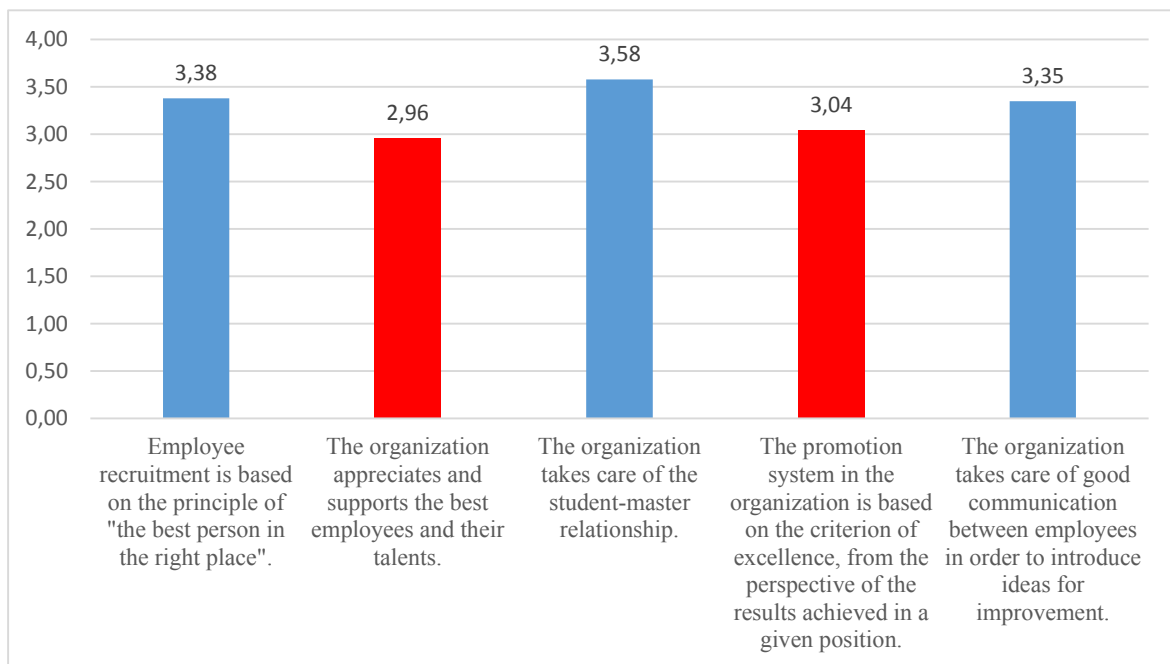


Figure 4. Assessment of the culture of excellence – management staff (average scores).

Source: Own research.

Top management should take care of improving the promotion system in the company and build a system that promotes the best employees.

3. Identification of occupational health and safety areas supporting the development of a culture of food quality and safety

In the audited enterprise, an analysis of the functioning occupational health and safety management system was carried out in terms of the possibility of using it to strengthen the development of the culture of quality and food safety. Based on the observations made during the audit and analysis of the enterprise documentation, the following common areas of occupational health and safety and the food safety management system were distinguished, which can interact with each other, resulting in the improvement of both the culture of occupational health and safety and the culture of quality and food safety:

- training,
- maintaining hygiene,
- protective clothing,
- risk management and crisis management,
- reporting culture and open communication,
- work ergonomics,
- supervision of chemical agents.

Table 4 presents proposed actions that can be taken in the above-mentioned areas.

Table 4.

Common areas for improving occupational health and safety culture and food quality and safety culture

Area	Actions to strengthen the improvement of occupational health and safety culture and food quality and safety culture
Training	During occupational health and safety and food safety training, common issues such as proper hand washing technique, wearing protective clothing or following sanitary instructions that apply on the production floor can be discussed. In addition, during training on the operation of machinery and equipment, employees can be reminded that by acting correctly during operation, they reduce the risk of accidents that may affect the safety of food production.
Maintaining hygiene	Employees should be made aware that by ensuring the cleanliness and hygiene of their workplace, they reduce the risk of accidents at work and thus minimise the risk of contamination of the food produced.
Protective clothing	Employees should be made aware that the protective clothing they use not only protects them against potential threats (e.g. burns, cuts), but also protects the manufactured products against contamination. At the same time, employees should be made aware that by wearing protective clothing they protect themselves against contamination, e.g. with pathogenic microorganisms originating from raw materials, where they can become infected through cross-contamination.

Cont. table 4.

Risk management and crisis management	Systematic identification and analysis of occupational health and safety hazards can help anticipate and avoid problems that could affect food quality and safety, e.g. hazards related to the operation of machinery/equipment, use of chemicals, etc. The culture of health and safety also supports the creation of crisis management systems that can help to quickly respond to emergencies that affect food quality and safety. Emergency procedures for fires, accidents or leaks of hazardous substances are essential to protect both employees and food in crisis situations.
Reporting culture and open communication	Open and honest reporting of safety concerns by all employees is essential to understanding and managing potential causes of future accidents. This is particularly true for food safety and quality. Electronic and paper reporting systems enable employees to report unsafe situations quickly and effectively, contributing to better quality management. Equally important is reporting how an employee is being assessed and admitting when they make poor decisions. Open and honest communication should take place between all levels of the workplace. It is also important to remember that regular audits of both health and safety and hygiene on production lines can help identify weak points in the production process.
Work ergonomics	The risk of developing ailments and diseases of the musculoskeletal system and peripheral nervous system occurs not only when performing typical physical work (in production), but also in office work, which is generally considered to be very light. The occurrence of the above-mentioned ailments has a negative impact on the quality and efficiency of the tasks performed, as well as on the employee's safety. These ailments significantly reduce the quality of life, reducing employee well-being, which in turn leads to more frequent errors. Ensuring an ergonomically correct workstation and proper work organization is the employer's responsibility, but it is worth making employees aware of this area and encouraging them to self-control their working conditions (participatory ergonomics). Reducing the physical load on employees through ergonomic workstations reduces the number of errors resulting from fatigue, which can affect the quality of food.
Supervision of chemical agents	Health and safety rules for managing chemicals and other hazardous materials used in production processes are key to ensuring food safety. Proper storage and use of chemicals, including detergents and disinfectants, in accordance with health and safety regulations reduces the risk of food contamination. Implementing strict procedures for employees working with hazardous substances supports food safety by eliminating the risk of product contamination.

Source: Own research.

The surveyed company, wishing to strengthen its culture of food quality and safety, should try to notice areas of occupational health and safety that can contribute to its improvement. The areas discussed above should be given special attention, due to the fact that they can mutually reinforce each other, and the synergy effect achieved will have tangible benefits for the company. The surveyed company should pay special attention to the area related to the culture of reporting and open communication, build a system for informing employees about how they are assessed, especially since the area of "human resources management" was assessed the lowest by the management staff, which is why it is worth building a clear path of professional advancement and a system for rewarding the best employees. About 30% of employees in the surveyed company do not perceive the validity of the procedures and believe that it is acceptable to break them when the company is under time pressure. Therefore, by strengthening the message during training, employees can be made aware of the importance of procedures and the importance of following them, regardless of whether there is time pressure or not. The training itself can be enriched with visualized examples of breaking procedures. You can use videos/photos illustrating accidents and their consequences (affecting

the employee's health and the quality and safety of food). When creating such training materials, you can use data sources from your own resources (audits, accidents) and from other companies. However, what is most important is consistency in actions, i.e. constant supervision by management staff and unconditional response in the event of identifying a situation related to non-compliance with established procedures. Employees must know that non-compliance with procedures is associated with negative consequences for themselves, while proper conduct will be appreciated.

4. Conclusions

Quality culture, especially safety, is a key element in the functioning of an organization, influencing the quality of products and processes. The authors point to the need to develop this culture in the food industry, which has also been taken into account in EU legal regulations. The article emphasizes the importance of continuous improvement and mutual influence between the culture of occupational health and safety and the culture of food safety, which aims to minimize the risk associated with food production. Areas of occupational health and safety culture have been identified, which will also be important from the point of view of the culture of quality and food safety. In order to achieve synergy in the development of both cultures in the organization, it is necessary to focus on these areas and develop them methodically by creating appropriate working conditions. Employee training and a culture of reporting and open communication can significantly increase employee awareness of the need to comply with the established principles of good production and hygiene practices, which will probably translate into compliance with the principles related to hygiene, proper use of protective clothing, careful handling of chemicals, and finally the development of employees' skills in perceiving potential threats to the product and production process as well as to themselves.

Acknowledgements

Co-financed from the funds of the Minister of Science granted under the “Regional Excellence Initiative” Program for the implementation of the project “Poznań University of Economics and Business for Economy 5.0: Regional Initiative – Global Effects (IREG)”.

References

1. *BRC Global Standard Food Safety, iss. 9* (2022).
2. Emond, B., Taylor, J.Z. (2018). The importance of measuring food safety and quality culture: results from a global training survey. *Worldwide Hospitality and Tourism Themes, 10, 3*.
3. Griffith, C.J., Livesey, K.M., Clayton, D. (2010). The assessment of food safety culture. *British Food Journal, 112, 4*.
4. *IFS Food Standard for auditing product and process compliance in relation to food safety and quality, version 8* (2023).
5. Nyarugwe, S.P., Linnemann, A., Hofstede, G.J., Fogliano, V., Luning, P.A. (2016). Determinants for conducting food safety culture research. *Trends in Food Science & Technology, 56*.
6. Sadłowska-Wrzesińska, J. (2018). *Kultura bezpieczeństwa pracy. Rozwój w warunkach cywilizacyjnego przesilenia*. Warsaw: Oficyna Wydawnicza Aspra.
7. Sadłowska-Wrzesińska, J. (2023). *Work Safety Culture: On The Edge Of Chaos*. Poznań: Foundation for Clean Energy, FNCE.
8. Wiśniewska, M., Grudowski, P. (2019). *Kultura jakości, doskonałości i bezpieczeństwa w organizacji*. Warszawa: CeDeWu.
9. Zanin, L.M., Stedefeldt, E., Luning, P.A. (2021). The evolution of food safety culture assessment: A mixed-methods systematic review. *Trends in Food Science & Technology, 118*.