

Szkiel, Agata

## Article

# Use of the Pn-En Iso 9004: 2010 standard for improvement of competitiveness of the food industry enterprises

Foundations of Management

## Provided in Cooperation with:

Faculty of Management, Warsaw University of Technology

*Suggested Citation:* Szkiel, Agata (2013) : Use of the Pn-En Iso 9004: 2010 standard for improvement of competitiveness of the food industry enterprises, Foundations of Management, ISSN 2300-5661, De Gruyter, Warsaw, Vol. 5, Iss. 1, pp. 69-81, <https://doi.org/10.2478/fman-2014-0007>

This Version is available at:

<https://hdl.handle.net/10419/184549>

## Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

## Terms of use:

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*



<https://creativecommons.org/licenses/by-nc-nd/3.0>

## USE OF THE PN-EN ISO 9004:2010 STANDARD FOR IMPROVEMENT OF COMPETITIVENESS OF THE FOOD INDUSTRY ENTERPRISES

Agata SZKIEL

Faculty of Entrepreneurship and Quality Science, Gdynia Maritime University, Gdynia, Poland  
e-mail: a.szkiel@wpit.am.gdynia.pl

**Abstract:** Food industry companies, functioning in an ever-changing and uncertain environment, look for ways to increase their competitiveness, including the improvement of effectiveness and efficiency of the implemented food safety management systems. Directions that can be used for this purpose are provided by the PN-EN ISO 9004:2010 standard. In the first part of the elaboration presented the requirements for the food safety management system included in the PN-EN ISO 22000:2006, and then the guidance of the PN-EN ISO 9004:2010 standard for providing the enterprise management system in order to achieve a sustained success in the turbulent environment. Followed by compared the guidelines and requirements of these two standards in order to evaluate the possibility of their combined use in the food industry enterprises. Next presented this guidelines of the PN-EN ISO 9004:2010 standard, which have no references to the requirements of the PN-EN 22000:2006, and are discussed how they can be helpful for enterprises in the food chain in the process of improvement of effectiveness and efficiency of the implemented food safety management systems.

**Key words:** food industry, PN-EN ISO 9004:2010, PN-EN ISO 22000:2006, quality management system, food safety management system.

### 1 Introduction

The primary goal of any enterprise is to achieve sustained success. The matter of competition on the modern market can be represented by the offers of individual companies that compete for the opportunity to effectively provide the finished products to their prospective buyers [2]. The competition applies to the market acceptance of the offer by purchasers [15]. The products are even more competitive, the greater extent to which they meet the requirements of customers in terms of price, quality or other features affecting the selection decision.

Also in the case of food, nowadays consumers look for food products that meet their needs and expectations as much as possible.

The requirements of food may refer to its various features such as: the organoleptic, nutritional, stability and convenience in use. However, the most important requirement for goods, resulting in food law, is its safety, conditioning the health of consumers. The European Union prefers the free flow of goods and services, but in the case of food it must be unconditionally secure [3]. While the organoleptic and nutritional value can be evaluated by the consumers at the time of the selection and purchase of food products, so far the assumption that the products are safe for consumers must be accepted only on the basis of the manufacturer's declaration [5]. Meanwhile, the successive food safety crises published in media, including: dioxin

contamination of animal feed, spread of serious animal diseases, such as bovine spongiform encephalopathy and avian flu, result in the decrease of consumer confidence in the quality and safety of traded food, and thus the loss of confidence to its manufacturers and distributors.

These food safety crises, as well as rapidly changing environment where the food industry enterprises function, along with the needs and expectations of consumers, forcing companies to change the current approach to the safety of produced and marketed food toward its assurance, within the enterprise management system. These changes are also the result and consequence of the reform of the EU food law, implemented in line with the 'White book of the food safety', published in 2000, that imposes on the enterprises from the food chain<sup>1</sup> the requirements to ensure food safety under the Hazard Analysis and Critical Control Point – HACCP [14].

One of the sources of competitive advantage of the food industry companies is therefore the safety of marketed food. In order to prove consumers their ability to produce food that is safe and meets their requirements, companies implement and submit to certification of the food safety

---

<sup>1</sup> The food chain notion can be interpreted as sequence of the stages and operations involved in the production, processing, distribution, storage and handling of a food and its ingredients, from primary production to consumption. The food chain also includes the production of materials intended to come into contact with food or raw materials [10].

management systems, in accordance with the requirements of the PN-EN 22000:2006 standard. Performed tests show that the information on the implemented system, placed on the food product or its packaging, is essential for consumers and affect purchasing decisions. Also in the evaluation of enterprises, the implementation of the food safety management system affects the growth of their competitiveness [3].

However, in the era of increasingly certified and implemented standardised management systems, in order to ensure the competitiveness of enterprises the implementation of the system is already inadequate – it is necessary to take measures in order to continuously enhance its effectiveness and efficiency. Therefore, the food industry enterprises seek for solutions that enable them to improve the effectiveness and efficiency of their food safety management systems, so that they can be the source of their competitive advantage. Guidelines that can be used for this purpose are provided by the PN-EN ISO 9004:2010 standard, designed for organisations of various types, which provides guidance helping to achieve sustained success through the use of the quality management system, functioning in the enterprise.

This article is a review. Its purpose is to determine, on the basis of the analysis of literature and standards for quality management and food safety, the extent to which the guidelines of the PN-EN ISO 9004:2010 standard can be used by the food industry enterprises in developing their competitive advantage.

## **2 Food safety management system in accordance with the PN-EN ISO 22000:2006 standard**

In order to standardise and harmonise the various standards and regulations for food safety in 2005, the International Organization for Standardization published the ISO 22000:2005 standard, the so-called 'Food safety management systems: Requirements for any organisation in the food chain' (introduced in Poland by the PKN in 2006). The main goal of this standard is that the most effective system in the area of food safety, bringing maximum advantages for both the company and all its interested parties is the system that is established, maintained and updated as a part of a comprehensive management system and is included in the total number of activities related to the management of the organisation [10].

In the PN-EN ISO 22000:2006 standard, one specified requirement for the food safety management system that

can be implemented in organisations carrying out activities at any stage of the food chain, wishing to demonstrate their ability to supervise food safety hazards and thus a consistent safety of food supplied to consumers [10].

The PN-EN ISO 22000:2006 standard specifies the requirements for the food safety management system in the following areas [10]:

- food safety management system, which specifies the general system requirements and the requirement for the documentation,
- management responsibility, including the requirements for management commitment, food safety policy, food safety management system planning, responsibility and authority, communication and management reviews,
- resources management, including human resource requirements, infrastructure, work environment,
- planning and realisation of safe products, including the requirements for pre-requisite programs, risk analysis, the HACCP plan, planning the verification of system and control of non-conformities,
- validation, verification and improvement, including the requirements for the validation of control measure, control of monitoring and measuring, verification and improvement of food safety management system.

The PN-EN ISO 22000:2006 standard may be the basis for certification of food safety management system. System certificate confirms that all food safety hazards are identified and assessed by the company and are controlled in such a way that the marketed products do not negatively affect the health of consumers.

## **3 The guidelines of the PN-EN ISO 9004:2010 standard**

One of the well-known and internationally recognised tools of a system approach to the enterprise management of the quality-oriented products and services provided to customers is the quality management system, built on the basis on the requirements and guidelines of the ISO 9000 standards. These standards are aimed at supporting the organisation, regardless of the size and nature of its activities, in the implementation, maintenance and continuous improvement of an effective management system that ensures compliance with customer needs and expectations, and as a result provides confidence to our products or services [11].

One of the standards included in the ISO 9000 series is the PN-EN ISO 9004:2010 standard, the so-called 'Managing for the sustained success of an organisation: A quality management approach'. It was developed in

order to provide the guidance to help organisations to achieve a sustained success<sup>2</sup> in demanding and constantly changing environment,<sup>3</sup> through the use of the organisation's quality management system [12]. In contrast to the PN-EN ISO 9001:2009 standard, which sets out the requirements for the system and can be the basis for the certification, the PN-EN ISO 9004:2010 standard has the status of the guidelines, so it is not intended for certification purposes. In comparison to the PN-EN ISO 9001:2009 standard, targets for customer satisfaction and product quality were extended in the guidelines of the PN-EN ISO 9004:2010 standard, so as to include the satisfaction of all interested parties of the organisation. In addition the PN-EN ISO 9001:2009 standard focuses only on the effectiveness of the quality management system, while the guidance of the PN-EN ISO 9004:2010 standard provides guidance on the continuous improvement of the effectiveness and efficiency of the entire organisation, including more comprehensive approach to its operation, as they in fact relate to the strategy management [7, 13].

The guidelines of the PN-EN ISO 9004:2010 standard have been included in six areas [12], i.e.:

- managing for the sustainable success of an organisation,
- strategy and policy,
- resource management,
- process management,
- monitoring, measurement, analysis and review,
- improvement, innovation and learning.

Their use is a step toward the implementation of the Total Quality Management (TQM) to the organisation.

In accordance with the guidelines of the PN-EN ISO 9004:2010 standard, a continued success of the organisation is achieved by its ability to meet the needs and expectations of not only its customers, but also other interested parties in a constantly changing environment (business, environment, community, society and country, abroad) for a long time and in a balanced way [7].

Like all the ISO 9000 standards, the PN-EN ISO 9004:2010 standard is intended to be applicable to all

organisations, regardless of the type of business. Thus, it can be used also by the food industry enterprises, especially those that have implemented the food safety management system, in accordance with the requirements of the PN-EN ISO 22000:2006 standard, as a tool to enhance competitiveness.

#### **4 Comparison of the guidelines of the PN-EN ISO 9004:2010 standard and the requirements of the PN-EN ISO 22000:2006 standard**

In order to evaluate the possibility of using the PN-EN ISO 9004:2010 standard in the food industry enterprises, owing the food safety management system in accordance with the PN-EN ISO 22000:2006 standard, one carried out a comparative analysis of the guidelines and requirements contained in these two normative documents (Table 1).

The analysis shows that almost all the guidelines of the PN-EN ISO 9004:2010 standard are reflected in the requirements of the PN-EN ISO 22000:2006 standard, although the requirements for the food safety management system, corresponding to the guidelines of the PN-EN ISO 9004:2010 standard have much narrower range. In fact they focus only on one aspect of the operation of the food industry enterprises, which is the food safety, and do not include other aspects being decisive to their success in the market.

The guidelines of the PN-EN ISO 9004:2010 standards, which have no references to the requirements of the PN-EN ISO 22000:2006 standard, include the guidelines on:

- achieving sustained success,
- management of financial resources,
- commitment and motivation of the people,
- cooperation with suppliers and partners,
- management of knowledge, information and technology,
- natural resource management,
- self-assessment,
- use of benchmarking,
- learning.

These guidelines (discussed further) may be used by the food industry enterprise to improve the effectiveness and efficiency of their food safety management systems, making perfect the performance of enterprises, and as a result the increase of their competitiveness.

<sup>2</sup> According to the guidelines of the PN-EN ISO 9004:2010 standard, the sustained success notion shall be interpreted as result of the ability of an organisation to achieve and maintain its objectives in the long term [12].

<sup>3</sup> PN-EN ISO 9004:2010 standard defines the organization's environment as combination of internal and external factors and conditions that can affect the achievement of an organisation's objectives and its behavior toward its interested parties [12].

Table 1. Relationship between the guidelines of the PN-EN ISO 9004:2010 standard and the requirements of PN-EN ISO 22000:2006 standard (*source: own study based on [10, 12]*)

Subclause in PN-EN ISO 9004:2010	Subclause in PN-EN ISO 22000:2006
4.1. (Managing for the sustained success of an organisation) General	4.1. (Food safety management system) General requirements 5.1. Management commitment
<b>4.2. Sustained success</b>	—
4.3. The organisation's environment	7.3.4. Intended use 7.3.5. Flow diagrams, process steps and control measures 5.6.1. External communication
4.4. Interested parties, needs and expectations	5.7. Emergency preparedness and response
5.1. (Strategy and policy) Generals	5.2. Food safety policy
5.2. Strategy and policy formulation	5.2. Food safety policy
5.3. Strategy and policy deployment	5.3. Food safety management system planning 8.5.2. Updating the food safety management system
5.4. Strategy and policy communications	5.6.2. Internal communication 5.6.1. External communication
6.1. (Resource management) Generals	6.1. Provision of resources
<b>6.2. Financial resources</b>	—
6.3. People in the organisation 6.3.1. Management of people	6.2. Human resources
6.3.2. Competence of people	6.2.2. Competence, awareness and training
<b>6.3.3. Involvement and motivation of people</b>	—
<b>6.4. Suppliers and partners</b>	—
<b>6.4.1. General</b>	—
<b>6.4.2. Selection, evaluation and improvement of the capabilities of suppliers and partners</b>	—
6.5. Infrastructure	6.3. Infrastructure 7.2. Pre-requisite programmes (PRPs)
6.6. Work environment	6.4. Work environment 7.2. Pre-requisite programmes (PRPs)
<b>6.7. Knowledge, information and technology</b>	—
<b>6.8. Natural resources</b>	—
7.1. (Process management) Generals	4.1. (Food safety management system) General requirements
7.2. Process planning and control	7.1. (Planning and realisation of safe products) Generals 7.2. Pre-requisite programmes (PRPs) 7.6.1. HACCP plan 8.2. Validation of control measure combinations 7.9. Traceability system
7.3. Process responsibility and authority	5.4. Responsibility and authority
8.1. (Monitoring, measurement, analysis and review) Generals	8.1. (Validation, verification and improvement of the food safety management system) Generals 8.3. Control of monitoring and measuring
8.2. Monitoring	7.6.4. System for the monitoring of critical control points 8.4.2. Evaluation of individual verification results
8.3.1. (Measurement) Generals	8.4. Food safety management system verification
8.3.2. Key performance indicators	7.6.4. System for the monitoring of critical control points 8.4.2. Evaluation of individual verification results
8.3.3. Internal audit	8.4.1. Internal audit



Subclause in PN-EN ISO 9004:2010	Subclause in PN-EN ISO 22000:2006
8.3.4. Self-assessment	—
8.3.5. Benchmarking	—
8.4. Analysis	8.2. Validation of control measure combinations 8.4.3. Analysis of results of verification activities
8.5. Review of information from monitoring, measurement and analysis	5.8. Management review 5.8.1. General 5.8.2. Review input 5.8.3. Review output
9.1. (Improvement, innovation and learning) Generals	8.5. Improvement 8.5.1. Continual improvement 7.10.2. Corrective actions 5.7. Emergency preparedness and response 7.2. Pre-requisite programmes (PRPs)
9.2. Improvement	8.5. Improvement 8.5.1. Continual improvement 7.10.2. Corrective actions 5.7. Emergency preparedness and response 7.2. Pre-requisite programmes (PRPs)
9.3. Innovation	7.3. Preliminary steps to enable hazard analysis 7.4. Hazard analysis 7.5. Establishing the operational pre-requisite programmes (PRPs) 7.6. Establishing the HACCP plan 8.4.2. Evaluation of individual verification results 8.5.2. Updating the food safety management system 7.8. Verification planning 8.2. Validation of control measure combinations 5.6.2. Internal communication
9.4. Learning	—

## 5 Managing for the sustained success of the food industry enterprise

In accordance with the guidelines of the PN-EN ISO 9004:2010 standard, the meeting of the needs and expectations of all its interested parties contributes to the lasting success of the organisation [12]. Comparison of actual results with the expectations, through the perspective of the requirements of different interested parties, is the essence of assessing the level of the competitiveness of the enterprise [15].

The PN-EN ISO 9004:2010 standard defines an interested party as a natural or legal person, which adds a value to the organisation and/or has an impact on its activity and results achieved [12]. In the case of the food industry enterprises, they mainly include food consumers, but also all organisations in the food chain (Figure 1).

Interested parties by the food chain may specify different requirements (Table 2).

Because the needs and expectations of interested parties and enterprises can be dynamically changed and be in conflict of interests with the requirements of the other party, the PN-EN ISO 9004:2010 standard promotes their performance in a balanced way. To make this possible, the enterprise shall [12]:

- plan in a long-term perspective,
- systematically monitor and analyse changes in its environment,
- identify interested parties, their needs and expectations and the impact on their operation and success,
- systematically engage interested parties, provide them with information about their activities and plans and establish mutually beneficial relationships,
- balance the competing needs and expectations of interested parties by applying different approaches, such as mediation, negotiation,
- identify and eliminate the risk of short- and long term perspectives affecting the achievement of a long-term success,
- predict future resource needs,

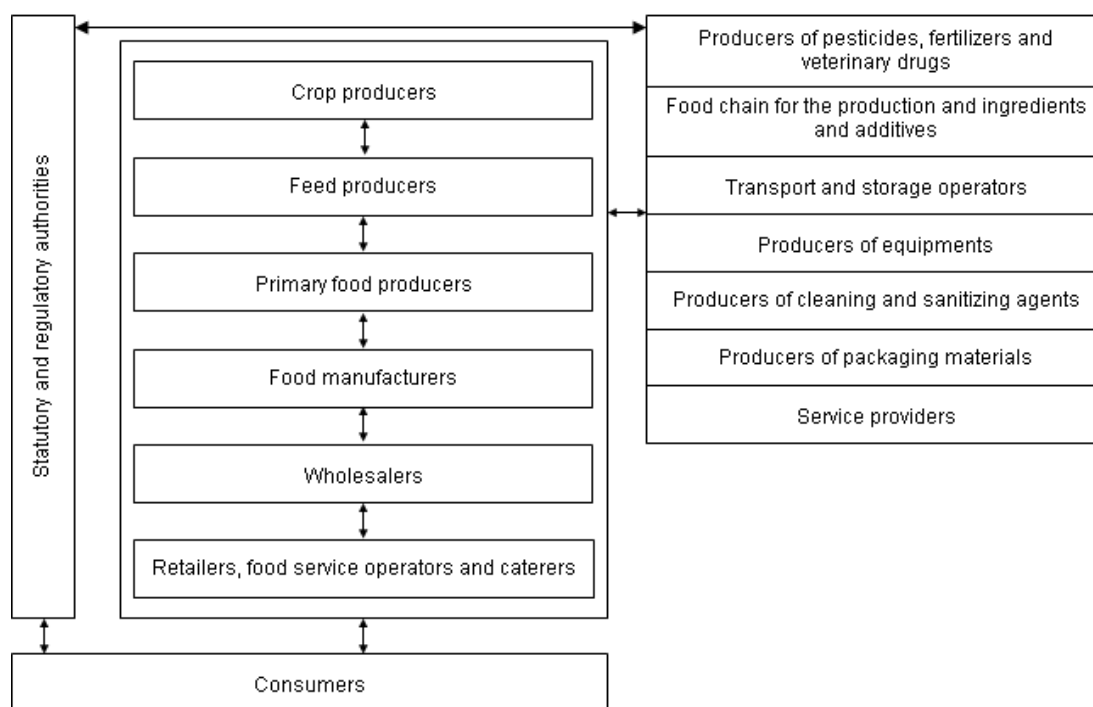


Figure 1. Interested parties by the food chain (*source*: [10]).

- systematically assess its compliance with current plans and identify the needs for any corrective and preventive actions,
- provide employees the opportunity to learn the benefit for themselves and the enterprise,
- implement the processes of innovation and continuous improvement leading to a sustained success.

## 6 Strategy and policy of the food industry enterprise

The basic document of the food safety management system, built on the basis of the requirements of the PN-EN 22000:2006, which sets out the obligations and directions of the company operation relating to food safety, is its policy of the food safety. The policy shall be appropriate to the nature of the company and its place in the food chain, in accordance with the requirements of the customers' food safety, communicated, implemented and maintained at all levels of the organisational structure of the company, viewed in terms of its usefulness and validity, and a framework for setting and reviewing objectives of the food safety [10].

The PN-EN 22000:2006 standard does not specify requirements for the formulation of the mission, vision and strategy of the enterprise. However, it is possible to formulate and implement the food safety policy without prior definition of the mission, vision and strategy in

this area. Thus, under the guidance of the PN-EN ISO 9004:2010 standard, the food industry enterprise that wants to achieve sustained success in the market shall establish and maintain vision, mission and shared values with regard to food safety, which will be understood, accepted and supported by all the staff of the enterprise, as well as all the interested parties [12]. They shall be determined taking into account the requirements of all interested parties (the company shall anticipate the potential conflicts arising from the different needs and expectations), the requirements of the food law, strengths and weaknesses, opportunities and threats.

In accordance with the guidelines of the PN-EN ISO 9004:2010 standard, the implementation of strategies and food safety policy requires [12]:

- to translate them into measurable objectives relating to the food safety,
- development and implementation of the schedule to achieve the objectives,
- to provide the resources necessary to achieve the objectives,
- assessment and elimination of the risks associated with the implementation of the objectives,
- implementation of the activities necessary to achieve the objectives.

Implemented activities shall not only be effective but also efficient – in order to optimise the use of the related resources [7].

Table 2. Examples of interested parties and their needs and expectations (*source: own study based on [12]*).

Interested party	Examples of needs and expectations
Consumers of food	Safety, quality, price and delivery terms of food Compliance with the food law Effective notification on food safety hazards Proper response to crises related to the food safety
Statutory and regulatory authorities	Compliance with the requirements of the food law Effective notification on food safety hazards Proper response to crises related to the food safety
Owners/ stakeholders	Stable profit Transparency of the organisation activities Compliance with the requirements of the food law
People in the organisation	Suitable work environment Job security Recognition and reward of achievements
Suppliers and partners	Mutual benefits and business continuity Effective notification on the food safety hazards
Community	Environment protection Ethical behaviour Compliance with the requirements of the food law and other requirements Effective notification on the food safety hazards Proper response to crises related to the food safety

Following the recommendations of the PN-EN ISO 9004:2010 standard, the enterprise shall implement its strategy and policy as well as obtain feedback from all interested parties in order to quickly and flexibly respond to changes in the environment in which it operates.

Policy and strategy of food safety shall be translated into processes implemented in the food safety management system. For this purpose, the enterprise shall [7, 12]:

- determine the relationship between their organisational structure, implemented system and various processes carried out in the system,
- identify potential problems in the interaction between the processes,
- provide resources for the implementation of priority improvement activities related to the food safety,
- provide an organisational structure for the establishment and implementation of a long- and short-term food safety plans at all levels of the enterprise.

## 7 Resource management

The competitive possibilities of the enterprise are significantly affected by the quality of their resources and the ability to use them. The entirety of the tangible and intangible resources, which shall be the property of the

enterprise in order to be able to use them to build, maintain and strengthen its competitiveness, is the potential of the competitiveness of the enterprise [15]. Resources, in addition to the organisational structure, processes and procedures are also one of the elements of the food safety management system built on the basis of the requirements of the PN-EN 22000:2006 standard. These resources include human resources, infrastructure and work environment [10].

In accordance with the guidelines of the PN-EN ISO 9004:2010 standards, thanks to the appropriate resource management, organisations operate effectively and efficiently and achieve sustained success. Therefore, the food industry can be used in the processes of production of the safe food and to the activities of the current operation.

### 7.1 Management of financial resources

The PN-EN 22000:2006 standard does not include requirements for the management of financial resources, because its requirements are focused on ensuring the effectiveness of the food safety management system. However, the decisive factor for the competitiveness of the food industry enterprises is the system that is not



only effective, and thus ensures the implementation of the objectives of food safety, both short- and long-term, but is also efficient and so the results obtained by enterprises exceed the costs of those inputs. Improvement of the effectiveness and efficiency of the system may in fact have a positive impact on the financial results of the company [12].

Efficiency of the food safety management system can be measured in financial terms, and therefore food industry enterprises can use the guidance of the PN-EN ISO 9004:2010 for the management of their financial resources. The standard recommends that while managing financial resources the enterprises shall determine the needs and sources of these resources in order to ensure their availability for present and future activities. Businesses can use two mechanisms to improve the efficiency of the food safety management system and its operation in financial terms [12]:

- interior, based on the reduction of interferences in the process (especially: any deviation from established critical limits in identified critical control points), reduction of non-compliance with the requirements of food produced (consumers, regulations, product specifications, product standards) and reduction of wastage of raw materials and time,
- exterior, based on the reduction of non-compliance with the requirements of food produced following its delivery to consumers, their damage, the cost of complaints and the cost of lost customers and markets.

Management of financial resources in an efficient food safety management system shall include the monitoring, controlling and reporting of information on the efficiency of the allocation and the use of these resources, related to the implementation of the strategy, policy and food safety objectives. The enterprise shall also review its financial results in order to identify ineffective and inefficient activities and take appropriate improvement actions.

## 7.2 Commitment and motivation of people

The most important resource of any organisation is the staff, as its awareness, commitment and competence are decisive to ensure the effectiveness and efficiency of its operation. Human resources are also essential to ensure the effectiveness of the food safety management system, and therefore the PN-EN 22000:2006 requires that the staffs executing actions in the system was aware of how these activities contribute to the assurance of the food safety and be competent on the basis of education, training, skills and experience [10].

In the management of human resources, food industry enterprises may use standard guidelines of the PN-EN ISO 9004:2010 for motivation of the staff (which are not included in the PN-EN 22000:2006 standard). According to these guidelines, the increase of commitment and motivation of the staff can be achieved by [7, 12]:

- improvement of the process of sharing knowledge and skills,
- introduction of the system of recognition and reward on the basis of individual assessments of the staff,
- establishment and implementation of a rating system of the professional appraisal and planning the staff career,
- systematic study of satisfaction, needs and expectations of the staff,
- providing both mentoring and coaching opportunities.

## 7.3 Cooperation with suppliers and partners

One of the resources that can determine the market success of the food industry is supplier (e.g. raw materials, semi-finished products, packaging and ancillary services) and partner<sup>4</sup> (e.g. institutions including technical, financial, governmental and non-governmental). Type of relationships with suppliers and partners and the way of their management can have a significant impact on the performance of the enterprise. The PN-EN 22000:2006 standard does not specify the requirements in this respect, however, the company that wants to be competitive shall maintain a positive relationships with their suppliers and partners, based on a common strategy, knowledge sharing, as well as gains and losses [12].

Using the recommendations of the PN-EN ISO 9004:2010, the food industry enterprises shall manage the cooperation with suppliers and partners in such a way to ensure improvement of their ability to deliver products and services that meet the requirements of the company. Thus, companies shall [12]:

- optimise the number of their suppliers and partners,
- provide a two-way flow of information on the needs and requirements of each party,
- ensure cooperation in the validation of the process capabilities implemented by suppliers and partners,
- monitor their ability to supply products in accordance with the requirements of the company,

<sup>4</sup> The partnership notation can be interpreted as agreement of two or more parties involved in the design and implementation of an object, the joint work to ensure its successful completion, by which they reach their goals, under conditions of reciprocity [8].

- share the knowledge with suppliers and partners in order to effectively and efficiently improve the process of delivery,
- involve suppliers and partners in the identification of needs for improvement of purchases and development of a joint strategy to ensure the food safety,
- evaluate, recognise and reward the achievement of suppliers and partners,
- analyse and eliminate the risks associated with cooperation, in particular those having impact on the food safety offered by the enterprise to the consumer.

The organisation shall also encourage their suppliers and partners to a mutual and continuous improvement of their management systems and to participate in joint initiatives in the area of improving, maintaining a balance between the objectives of short- and long-term objectives [7].

#### **7.4 Management of knowledge, information and technology**

A key resource in the organisation functioning in the knowledge-based economy is information. Intellectual capital is becoming increasingly important as a factor determining the competitive advantage of enterprises [2].

Information is considered to be basic resources necessary to continuously improve the knowledge of the organisation and its lack is a barrier to a continuous improvement of both the food safety management system and the performance of the enterprise [9, 17]. The PN-EN 22000:2006 standard does not specify requirements for the management of knowledge, information and technology, but any food enterprise shall specify the principles for identification, preparation, maintenance, protection, use and assessment of these resources. Companies shall also share knowledge, information and technology with their stakeholders, especially in the context of the need for effective flow of information about dangers of the food safety throughout the food chain.

Enterprises that want to achieve success in the market, shall manage:

- external information, such as the food law, results of controls carried out by the official food control authorities, results of audits of the second and third party,
- internal information, such as the results of the monitoring of critical control points in the process, results of testing of raw materials, semi-finished and finished products, consumer satisfaction survey results, results of internal audits and audits of suppliers, system verification.

In accordance with the guidelines of the PN-EN ISO 9004:2010 standard, information management shall include [12]:

- identification of the information needs of both internal and external sources of information,
- acquisition of knowledge and experience of the enterprise staff,
- acquisition of knowledge from business stakeholders,
- processing of information into the knowledge necessary to make decisions related to the improvement of the implemented food safety management system and the functioning of the enterprise,
- use of data, information and knowledge in defining and implementing the strategy and objectives of the food safety,
- evaluation of the benefits of using information in order to improve the management of information and knowledge,

The decisive factor for the competitiveness of the food industry enterprises is also the technology they have. Thus, following the guidelines of the PN-EN ISO 9004:2010 standard, companies shall consider and make a choice of technological options that enable an increase of effectiveness and efficiency in the areas of product making, marketing and customer relations [7]. This shall include the assessment of the current level of technology, costs and benefits associated with it, the risks associated with changes in technology, environment and opportunity to respond to changing customer requirements [12].

#### **7.5 Management of natural resources**

One of the types of resources that are crucial to the operation of the food industry enterprises are natural resources. In the case of these companies, natural resources can significantly affect the safety of the food produced, and thus achieve a long-term success. Natural resources can thus determine the competitiveness of the enterprise, and often are outside its direct supervision [17]. Therefore, in accordance with the guidelines of the PN-EN ISO 9004:2010 standard, companies shall systematically analyse the risks associated with the availability of these resources and have contingency plans to ensure their availability and their replacement with others [12].

As mentioned before, the success of the enterprise depends on its compliance with the requirements of all stakeholders. Because one of these requirements may be the protection of environment, in the management of natural resources the enterprise shall take into account the

environmental aspects throughout the life cycle of food produced, from design through manufacture, distribution, up to the disposal of the packaging. Therefore, companies can integrate the food safety management systems with the environmental management systems, for example using the requirements of the PN-EN ISO 14001:2005 standard.

## 8 Self-assessment

In order to identify the elements of the food safety management systems for improvement, which is necessary for the proper planning and the implementation of improvement activities, enterprises shall be subjected to a systematic assessment of both their effectiveness and efficiency. Both internal audits and management reviews, conducted in accordance with the requirements of the PN-EN 22000:2006 standard, provide enterprises with information on the effectiveness of their systems, but this information, however, is limited mostly to the degree to which systems can meet the requirements of the PN-EN 22000:2006 standard and other requirements of companies, *inter alia*, according to provisions of the food law, product standards and system documentations. They do not provide any details on the efficiency of the systems, which is one of the determinants of the competitiveness of the food industry enterprises. Hence, it is necessary to use additional methods of assessment that will provide companies comprehensive and precise information on the strengths and weaknesses of their systems, enable them to determine priorities for improvement in this area and provide an incentive to improvement activities.

The PN-EN ISO 9004:2010 standard recommends that enterprises shall evaluate the implemented management system, using the self-assessment. The concept of self-assessment is to understand a systematic, comprehensive and complex review of organisational activities and its outcomes (...), aimed to identify the strengths and areas for organisational improvement, providing the possibility of prioritising the planned follow-up activities that can be regularly monitored [4]. Self-assessment can be carried out in relation to the management system or a model of excellence [12]. It can therefore be carried out in relation to the guidelines of the PN-EN ISO 9004:2010 standard or a selected model of the organisational excellence, as defined in the criteria for regional, national or international awards for quality. The scope of self-assessment can be flexibly adapted to the objectives and priorities of the enterprise, and so each of them can develop its own model of self-assessment in relation to any management

system. Therefore, the food industry enterprises may also carry out the self-assessment with regard to the requirements of the PN-EN 22000:2006 standard.

The self-assessment shall be the basis for any action taken by the food industry enterprise, regardless of its size, organisational structure, type of food supplied to consumers. It is impossible, however, to efficiently and effectively manage and undertake systematic and continuous improvement activities, without information resulting from the self-assessment of information on the results achieved by the enterprise. Thus, the self-assessment shall be the basis for planning and monitoring of the strategy and policy for enterprises in food safety and implementation of any tools for use of their enterprise resources [1]. In order to enable the monitoring of the performance of enterprises at the time, the self-assessment shall be carried out systematically [13].

While carrying out the self-assessment, the food industry enterprises can assess the level of maturity of its food management system and identify the needs as well as set the priorities for their improvement. Because it is not possible to improve all areas of the functioning of the enterprise at the same time, only on the basis of analysis of the strengths and weaknesses, the management can set goals and priorities in this field [16].

In the food industry enterprises, the self-assessment does not have to be limited to the evaluation of their safety management systems; companies can comprehensively cover their whole system of management. The self-assessment may in fact be used to [7]:

- establish priorities and action plans enabling the enterprise to achieve sustained success,
- implement the improvements and innovations in processes, products and organisational structure,
- monitor and improve the financial performance,
- collect input data for periodic review of the effectiveness of the enterprise management system and evaluate its competitiveness.

The PN-EN ISO 9004:2010 standard proposes two types of the self-assessment [7]:

- The overall self-assessment, providing information on the level of maturity in six key areas of management, listed in the standard;
- The detailed self-assessment, providing information on the organisational performance in relation to the recommendations of various subsections of the chapters of the PN-EN ISO 9004:2010 standards.

The overall self-assessment shall be performed by the top management of the enterprise, while the detailed

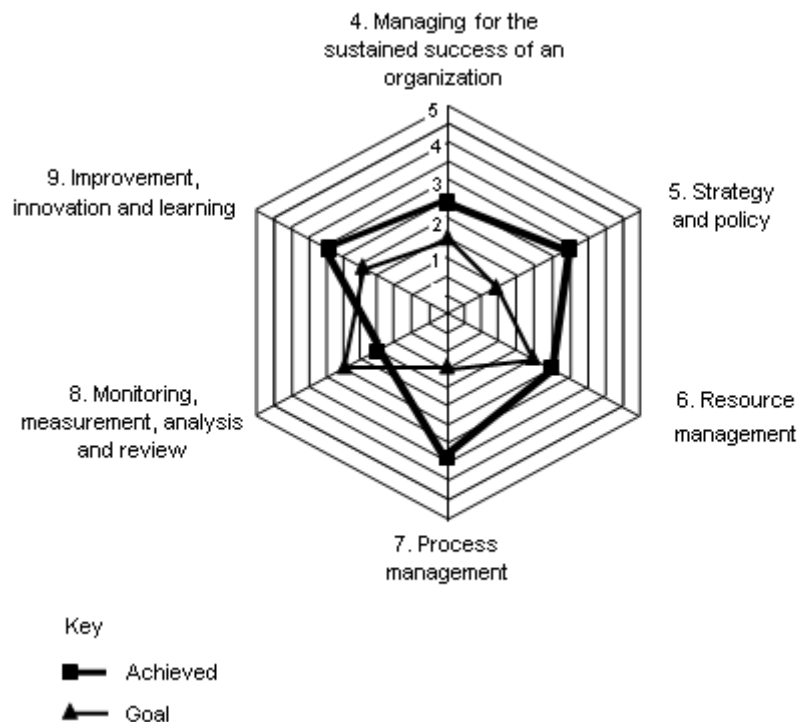


Figure 2. Example illustration of the results of a self-assessment (*source*: [12]).

self-assessment shall be performed by the operational management. In both cases, the assessment may be carried out at a five scale of maturity levels proposed by the PN-EN ISO 9004:2010, or customised to suit the needs of the enterprise [12]. Self-assessment results shall be related to the objectives set out by the enterprise in order to achieve them in each area (Figure 2), while the results of the analysis of the differences between the goals pursued and the results obtained shall be used to identify, plan and implement the improvement activities.

## 9 Benchmarking

In accordance with the guidelines of the PN-EN ISO 9004:2010 standard, in the improvement of the food safety management systems, necessary to increase the competitiveness of the food industry enterprise, can be used for the benchmarking, defined as a method of measurements and analysis, enabling the search for best practices in the enterprise and beyond it, in order to improve their own management [12].

Using the guidelines of the PN-EN ISO 9004:2010, the food industry enterprises may carry out the benchmarking, including [12]:

- internal, including procedures implemented in the food safety management system (competition between organisational units is not market-oriented, but has an ef-

fect on the growth and decline in the competitiveness of enterprises [15]),

- external, including developments and processes carried out by rival enterprises in the food chain,
- general, by comparing the strategies, activities or processes with unrelated organisations.

Companies can submit to the benchmarking the strategies and policies for the food safety, processes implemented in the food safety management system, individual food products offered to consumers, as well as organisational structures.

## 10 Learning

While using the guidelines of the PN-EN ISO 9004:2010 standard, the food industry enterprises can improve the effectiveness of the implemented food safety management systems through a learning process, defined as the collection and analysis of information from various sources, including the events on the successes and failures.

The ability to learn, providing a quick access to knowledge and its use, is one of the factors that determine a company's ability to achieve sustainable success. Enterprises shall learn through a combination of knowledge, patterns of thinking and patterns of behaviour of people with the values of the company, on the basis on teamwork, interacting and creative sharing of knowledge, both inside and



outside the company [7, 12]. The learning process shall be supported by the top management of the enterprise, through the recognition and rewarding of the excellence of the staff and the creativity appreciation [12].

## 11 Summary

Since joining the European Union, Poland has become a part of the single market of food, which is characterised by an intense competition to win the consumer, for whom an essential matter is the safety of purchased products. The fulfilment of the requirements of the PN-EN ISO 22000:2006 standard ensures the safety of the food produced by the enterprise, however, it may be insufficient to achieve the business success. In order to make the food safety management systems the source of competitive advantage, the food industry enterprises shall continuously improve their effectiveness and efficiency.

Competitiveness may be defined as the ability to adapt the company to the changes in its environment. Enterprises are even more competitive, the greater their ability to immediately respond to these changes. The PN-EN ISO 22000:2006 standard provides only the identification and meeting the customer requirements for the food safety. However, the use of the guidelines of the PN-EN ISO 9004:2010 standard ensures not only the identification and meeting all current needs and expectations of each party interested, but also provides a fast and flexible adaptation of the requirements to these changes.

The requirements of the PN-EN ISO 22000:2006 standard are much narrower in scope than the guidelines of the PN-EN ISO 9004:2010 standard. The PN-EN 22000:2006 standard focuses on the most important, but only on one aspect of the functioning of the entities in the food chain, which is the safety of food supplies to consumers, regardless of all other aspects of enterprise management. Its main objective is to ensure the effectiveness of the food safety management system, without specifying the requirements for its efficiency. However, the PN-EN ISO 9004:2010 standard establishes the guidelines for a comprehensive, strategic, both effective and efficient organisational management system. Thus, the combined use of the standards of the PN-EN 22000:2006 and the PN-EN ISO 9004:2010 may be helpful for enterprises in the food chain to maximise the use of implemented food safety management systems to strengthen their competitiveness. The integration of these two approaches to the organisational management ensures that the food safety management system is an integral part of a comprehensive enterprise

management system, ensuring an effective and efficient implementation of the adopted strategy and objectives.

Food industry enterprises, wishing to improve their food safety management system, resulting in the increase of their competitiveness, can in particular use the guidelines of the PN-EN ISO 9004:2010 standard, for:

- balanced meeting of the needs and expectations of all its interested parties, concerning the food safety and other requirements for enterprises, as well as a flexible respond to changes in business environment,
- formulation and communication of strategies and policies for the enterprise, taking into account the objectives of the food safety, as well as its effective and efficient implementation,
- assurance, monitoring, supervision and analysing the financial resources, necessary to ensure the effective and efficient functioning of the food safety management system and the functioning of the enterprise,
- development, implementation and improvement of the system to engage and motivate the staff,
- closer cooperation with suppliers based on the principles of creation of the value for both parties,
- management of intellectual capital and technology of the enterprise, providing an effective and efficient execution of processes,
- analysis of the risks associated with the availability of natural resources and taking actions to reduce the risk, as well as minimise the negative impact of enterprise activities on the environment,
- use of complex methods to assess the organisational management system, a part of food safety management system, such as self-assessment and both internal and external benchmarking.

The PN-EN ISO 9004:2010 standard provides versatile solutions that can be successfully used by companies throughout the food chain in order to obtain the best results and sustainable business success. Each company that wants to achieve tangible benefits of its use shall be translated into concrete, practical actions.

## 12 References

- [1] Cholewicka-Goździk K. - *Samoocena. Nieformalna zasada zarządzania jakością (Self-assessment. Informal principle of the quality management)* [in] Problemy jakości, No. 6, 2011, pp. 4–6.
- [2] Frączek P. - *Determinanty konkurencyjności sektorów i przedsiębiorstw. Ujęcie teoretyczne (Determinants of competitiveness of industries and companies. The theoretical approach)* [in] Przedsiębiorstwo i region, No. 1, 2009, pp. 7–17.



- [3] Górna J. - *Konkurencyjność przedsiębiorstw przemysłu mięsnego i mleczarskiego na terenie Wielkopolski w aspekcie spełnienia wymagań prawa żywnościowego Unii Europejskiej (Competitiveness of the enterprises from meat and milk industries in the Wielkopolska region in terms of meeting the requirements of the food law of the European Union)* [in] Zeszyty Naukowe SGGW w Warszawie. Problemy rolnictwa światowego, Vol. 7(XXII), 2009, pp. 5–12.
- [4] Haffer R. - *Samoocena i pomiar wyników działalności w systemach zarządzania przedsiębiorstwem. W poszukiwaniu doskonałości biznesowej (Self-assessment and performance of the results of the enterprise in the organizational management systems. In search of business excellence)*. Wydawnictwo Naukowe Uniwersytetu Mikołaja Kopernika, Kraków 2011.
- [5] Kijowski J., Sikora T. (ed.) - *Zarządzanie jakością i bezpieczeństwem żywności. Integracja i informatyzacja systemów (Management of the quality and food safety. System integration and computerization)*. Wydawnictwo Naukowo–Techniczne, Warszawa 2003.
- [6] Kociszewski M., Szwacka - Mokrzycka J. - *Uwarunkowania rozwoju przemysłu spożywczego po przystąpieniu Polski do UE (Conditions of the development of the food industry after the Polish accession to the EU)* [in] Zeszyty Naukowe SGGW w Warszawie. Problemy rolnictwa światowego, Vol. 11(XXVI), No. 2, 2011, pp. 67–77.
- [7] Krawczyk L. - *Wytyczne normy ISO 9004:2009. Narzędzie do strategicznego zarządzania organizacją. Nowe wydanie normy ISO 9004:2010 – krok w kierunku TQM (Guidelines of the ISO 9004:2009 standard. A tool for the strategic management. New edition of the ISO 9004:2010 standard - a step towards the TQM)* [in] Problemy jakości, No. 5, 2011, pp. 4–9.
- [8] Lisowski J.L. - *Zarządzanie jakością w przedsiębiorstwie (Quality management in the enterprise)*. Wyższa Szkoła Finansów i Zarządzania w Białymstoku, Białystok 2004.
- [9] Luning P.A., Marcelis W.J., Jongen W.M.F. - *Zarządzanie jakością żywności. Ujęcie technologiczno–menedżerskie (Food quality management. A techno managerial approach)*. Wydawnictwo Naukowo–Techniczne, Warszawa 2005.
- [10] PN-EN ISO 22000:2006 *Systemy zarządzania bezpieczeństwem żywności. Wymagania dla każdej organizacji należącej do łańcucha żywnościowego (Food safety management system. Requirements for any organization in the food chain)*.
- [11] PN-EN ISO 9001:2009 *Systemy zarządzania jakością. Wymagania (Quality management systems. Requirements)*.
- [12] PN-EN ISO 9004:2010 *Zarządzanie ukierunkowane na trwały sukces organizacji. Podejście wykorzystujące zarządzanie jakością (Managing for the sustained success of an organization. A quality management approach)*.
- [13] Rogala P. - *Zarządzanie według nowej normy ISO 9004. Ukierunkowanie na trwały sukces organizacji (Management in accordance with the new ISO 9004 standard. Focusing on the organizational continued success)* [in] Problemy jakości, No. 3, 2011, pp. 9–12.
- [14] Rozporządzenie (WE) nr 852/2004 Parlamentu Europejskiego i Rady z dnia 29 kwietnia 2004 r. w sprawie higieny środków spożywczych (*on the hygiene of foodstuffs*) (Dz.U. UE L 139 z 30.04.2004).
- [15] Stankiewicz J.M. - *Konkurencyjność przedsiębiorstwa. Budowanie konkurencyjności przedsiębiorstwa w warunkach globalizacji (Competitiveness of the enterprise. Building the competitiveness of the company in the context of globalization)*. TNOiK, Toruń 2005.
- [16] Steinbeck H.H. - *Total Quality Management. Kompleksowe Zarządzanie Jakością. Doświadczenia praktyczne z IBM Niemcy (Total Quality Management)*. Agencja Wydawnicza Placet, Warszawa 1998.
- [17] Urbaniak M. - *Zarządzanie jakością. Teoria i praktyka (Quality management. Theory and practice)*. Centrum Doradztwa i Informacji Difin sp. o.o., Warszawa 2004.
- [18] Zymonik J. - *Samoocena w kontekście Polskiej Nagrody Jakości – kryteria i trendy (Self-assessment in the context of the Polish Quality Award – criteria and trends)* [in] Prace i Materiały Wydziału Zarządzania Uniwersytetu Gdańskiego, Zarządzanie i Finanse / Journal of Management and Finance, No. 3/1, 2012, pp. 141–156.