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«ҒЫЛЫМ ЖӘНЕ БІЛІМ – 2017»

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XII Халықаралық ғылыми конференциясының
БАЯНДАМАЛАР ЖИНАҒЫ

СБОРНИК МАТЕРИАЛОВ

XII Международной научной конференции
студентов и молодых ученых
«НАУКА И ОБРАЗОВАНИЕ – 2017»

PROCEEDINGS

of the XII International Scientific Conference
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«SCIENCE AND EDUCATION - 2017»



14th April 2017, Astana



**ҚАЗАҚСТАН РЕСПУБЛИКАСЫ БІЛІМ ЖӘНЕ ҒЫЛЫМ МИНИСТРЛІГІ
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The proceedings are the papers of students, undergraduates, doctoral students and young researchers on topical issues of natural and technical sciences and humanities.

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**PRODUCT SAFETY MANAGEMENT: CERTIFICATION IN ACCORDANCE
WITH RECOGNIZED STANDARDS**

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High rates of quality rendering of services of the enterprise can be provided only if the enterprise possesses the indicators meeting needs of clients. In that case, quality of rendering of services - an actual economic problem. In modern conditions abroad logistic services became a component of commodity distribution and distributive systems of goods in the conditions of bitter competitive struggle for production sales markets. In Europe the IFS standard has also deservedly gained long ago authority and recognition. In recent years in Kazakhstan interest in logistics, in improvement to systems of logistic management in the sphere of production and merchandising gradually increases.

The president Nazarbayev N. A. in the Message to the Kazakhstan nation puts emphasis on development of turnover and quality of products. It should be noted that now in Kazakhstan there are certain problems in rendering services of the integrated. Requirements to safety of production grow. Consumers and the government supervisory authorities impose more and more strict requirements to quality and safety of foodstuff. In case of a problem her source has to be immediately revealed and eliminated. These requirements first of all concern retail trade, however responsibility for quality and safety of food extends to all chain of suppliers, including producers of food products, raw materials and transport companies now.

Modern approach to quality management distinguishes his aiming at continuous improvement of processes and results of work in all divisions of the enterprise. Distinctive elements of this approach are orientation of management to quality control of processes and prevention of a possibility of defects. Full assignment of responsibility for quality of results of work on direct performers, and also active use of a human factor, development of creative potential of workers and employees by motivation of work. As an important element of quality management serve also detailed research and the analysis of the arising problems of ensuring quality at all development stages, production and operation of production by the principle of the ascending stream, that is from the subsequent operation of this process to previous.

Today, food producers need to ensure that their product is grown in safe conditions and in accordance with environmental requirements. New consumer demands, requirements of retail trade and legislation led to the emergence of new requirements for farmers and producers. They need to follow production technologies that reduce the impact of agriculture and fish farming on the environment (on land and at sea), reduce the use of chemicals and rationally use natural resources, while taking care of workers, farm animals and marine life. The ability to confirm fulfillment of obligations in the field of agriculture and fish farming has become a key condition for entering the market.

What is GlobalGAP certification? GlobalGAP is a recognized worldwide series of agricultural standards that establish agricultural practices/fisheries. Through certification, manufacturers confirm their compliance with the requirements of GlobalGAP standards. For consumers and retailers, the GlobalGAP certification means that the product meets the proper level of safety and quality and is environmentally friendly, taking care of occupational health and safety of workers, the state of the environment and animal welfare. Without such confirmation, it may be

difficult for farmers to gain access to markets. Bureau Veritas is well aware of all aspects of this issue and suggests conducting the audits required to obtain a GlobalGAP certificate.

GlobalGAP is becoming an indispensable standard, as most retailers today require certification on it, as evidence of the application of recommended agricultural / fish farming practices. Certification of GlobalGAP is necessary for producers of crops and farmers who grow animals / fish for human consumption. Without such certification, their products will not be procured by trading enterprises. Exporters of products to European countries and to other markets (Asia and America) are also required to comply with the production standards established under the GlobalGAP certification scheme.

The FSSC 22000 scheme was created by a non-profit organization - the Foundation for Food Safety Certification. FSSC 22000 is included in the list of standards recognized by GFSI - the Global Food Safety Initiative, an organization created by the world's leading retailers and large food producers. The goal of GFSI is to harmonize the standards of food safety management systems.

FSSC 22000 was developed for the certification of food safety management systems for food supply chain organizations that process or produce livestock products, perishable vegetable products, long shelf-life products and (other) food ingredients such as supplements, vitamins and biocultures, and Also packaging for food. The FSSC certificate 22000 certifies that the food safety management system of the certified organization fully meets the requirements of FSSC 22000. The value of the certificate is the effort that the FSSC certified 22000 organization is making to maintain the food safety management system and its commitment to continuous improvement of the system.

The international standard of production of foodstuff (IFS — International Food Standard) is the general standard of food safety with uniform system of the assessment used for division into categories and selection of suppliers. It helps retail sellers to ensure food safety of the production and to carry out monitoring of a level of quality of producers of branded food products of retail sellers.

The fundamental objectives of IFS, as well as for other IFS Standards, are:

- to establish a common standard with a uniform evaluation system,
- to work with accredited certification bodies and qualified IFS approved auditors,
- to ensure comparability and transparency throughout the entire supply chain,
- to reduce costs and time for both suppliers and retailers.

Experience, changes in legislation and a revision of the GFSI Guidance Document lead to the need to work towards a revision of version 1. A detailed and extensive questionnaire was developed, which would allow all interested parties to get involved in the further development of the IFS Logistics Standard. This questionnaire was sent by e-mail in 2009 to certification bodies and companies with experience in IFS Logistics version 1, allowing all those involved to be part of the process. All the completed questionnaires were subject to detailed analysis. Moreover, representatives of logistics companies and certification bodies have participated in all steps of the review process for even more expertise sharing and transparency.

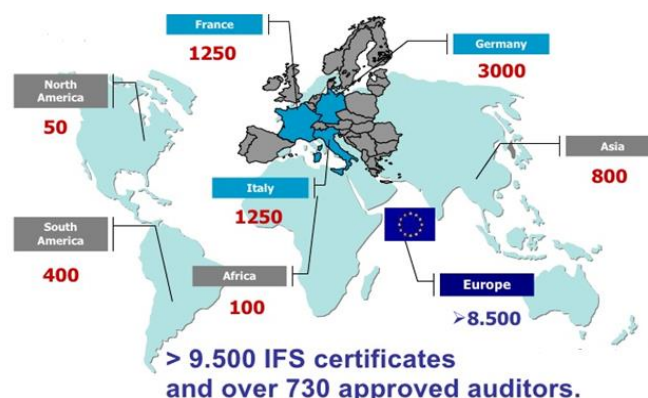


Figure1– IFS standard in the world

IFS standard spread in the world. Spread of IFS given in Figure 1. The most significant retail salesmen in Europe require the presence of certification on the standard IFS from suppliers, who participate in their network of supply. However, standard IFS is international standard and can also be applied to the suppliers beyond the limits of Europe.

Present standard allows for the organization:

- To ensure confirmation of directivity to the food safety and, in the case of the appearance of incidents in the region of food safety, the protection within the framework of the concept of the complex of checks.

- to build and to introduce in the work the system of management, which facilitates higher correspondence to requirements on the quality/of safety of production and observance of normative requirements, with the special reference to the legislation, used in the countries, where the end products are consumed

Company “food products” obtained the international certificate of the food safety IFS. GK “food products” - the most important producer of the frozen semi-finished products.

Company “food products”, most important producer of the frozen semi-finished products, sequential time confirmed the correspondence to food safety of output (frozen p/f and culinary articles) to requirements to international standard.

Table 1

Scoring and awarding of certificates

Audit result	Status	Action company	Report form	Certificate
At least 1 KO scored with D	Not approved	Actions and new initial audit to be agreed upon	Report gives status	No
> 1 Major and/or < 75 % of the requirements are fulfilled	Not approved	Actions and new initial audit to be agreed upon	Report gives status	No
Max 1 Major and ≥ 75% of the requirements are fulfilled	Not approved unless further actions taken and validated after follow-up audit	Send completed action plan within 2 weeks of receiving the preliminary report. Follow-up audit max. 6 months after the audit date	Report including action plan gives status	Certificate at foundation level, if the Major non-conformity is finally solved as controlled during the follow-up audit
Total score is ≥ 75 % and < 95 %	Approved at foundation IFS Logistics level after receipt of the action plan	Send completed action plan within 2 weeks of receiving the preliminary report.	Report including action plan gives status	Yes, certificate at foundation level, 12 months validity
Total score is ≥ 95 %	Approved at higher IFS Logistics level after receipt of the action plan	Send completed action plan within 2 weeks of receiving the preliminary report.	Report including action plan gives status	Yes, certificate at higher level, 12 months validity

The audit report where one or several Major non-conformity (ies) has/have been identified shall always be uploaded into the IFS audit portal after receiving the action plan (only for administrative purpose, but will not be visible).

Specific situation in case of follow-up audit:

If a Major non-conformity has been identified with a total score of 75 % or above and then resolved, and if the audit result is deemed positive:

- The certification body shall mention on the updated audit report;
- In the “final result of audit” section: specify that a follow up audit has taken place and that the Major non-conformity has been solved;
- The company cannot be certified with higher level even if the final total score is equal or more than 95 %;
- The same valid date of the certificate remains in the certification cycle as described in 6.2;
- It shall be defined on the certificate the date of initial audit and date of follow-up audit;

Specific management of the audit process in case the final score is < 75 %. In these situations, the certification is failed and a complete new audit shall be performed. The new audit shall be scheduled no earlier than 6 weeks after the audit where the final score was < 75 %.

Specific management of the audit process in case of multi-site companies (Table 1).

–All KO requirements shall be audited at all sites even if some of them are partly managed at the central managing site.

–In the audit report of each site, only the audit date of the respective site shall be mentioned; the audit date of managing site is not additionally necessary.

–In case that a Major non-conformity or a KO scored with D has been issued during the audit of the central managing site, all audited sites are also affected and the certificates of these sites shall be suspended (according the procedure described above).

Certification for correspondence to the requirements of standard IFS gives the outstanding possibility to supply our own food production for the European market enterprises. But for those suppliers, who are terms FCD or HDE, certification IFS is necessary in order independent of the country of company- supplier to sign agreement. Certification IFS - this is authoritative measure practically for each enterprise, which accomplishes production or processing of food production. The requirements of present standard are acknowledged as the largest worldwide networks of the retail and wholesale trade, in which the annual turnover comprises not less than sixty percent of entire world revolution.

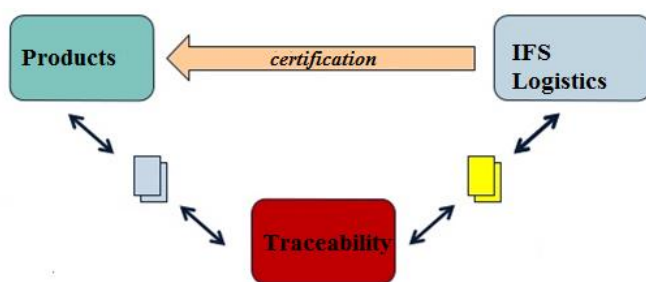


Figure 2– Traceability of goods

A complete management of the traceability of each one of the sub-processes was conducted, preparing BPMN diagrams of their different units for each one of them. A traceability system shall be in place which allows the full identification of product and the labeling of the product shall be done in a way to facilitate full traceability. The traceability system shall ensure full traceability from the supplier (defined to batch numbers) to the customer (Fig.2). Test results shall be recorded, given in Figure 2. The traceability system shall be tested on a periodic basis – at least annually and each time traceability system changes. The test shall verify upstream and downstream traceability (from

delivered products to raw materials, and vice versa), including quantity checking.

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INDUSTRIAL REVOLUTION: SMART FACTORY

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Nowadays people live in the ever-increasing technological world. Yesterday’s dream smart environment is already exists in reality and almost everything is connected to each other by the Internet through different devices and systems. According to Gartner Inc., which is an American information technology research and advisory firm this phenomenon can be explained by use of the Internet of Things (IoT) and Services, (Figure 1 below) that is defined as “*a network of physical objects that contain embedded technology to communicate, sense, or interact with internal or external environments*” (Wilson, 2014).

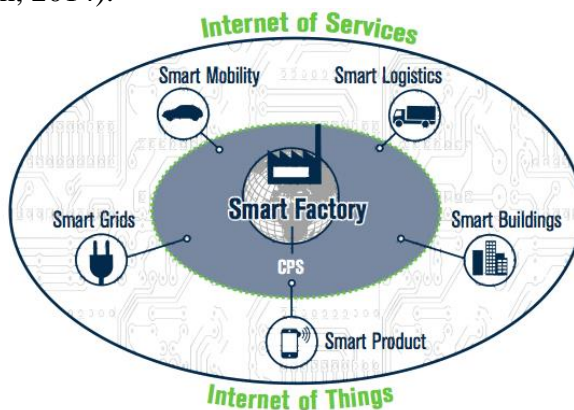


Figure 1 – Industry 4.0 and smart factories as part of the Internet of Things and Services
(Federal Ministry Of Education And Research, 2013)

In other words, everything is connected and self-organised without actual human interaction. This idea led to the so-called “fourth industrial revolution”, where “*self-organising factories, with machines and tooling “talking” to one other, planning systems and even the products they are making*” (Tinham, 2013). Particularly, Germany pioneered to realise and start such new revolutionary industrialisation called “Industrie 4.0” (Mittermair, 2015, Federal Ministry Of Education And Research, 2013).

The term “Industrie 4.0” made its first public emergence in 2011 at the Hanover Trade Fair. At that time the idea of advanced integrated manufacturing processes, where machines are able to actually communicate through IoT seemed like science fiction. It sounded really challengeable to connect virtual world, where data is processing to the real world, where manufacturing processes