

LEGISLATION AND OTHER ISSUES ABOUT HYGIENIC ENGINEERING ASPECTS IN EU AND BALKAN COUNTRIES

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Abstract

Although Food safety systems/standards are well known for more than 50 years, legislative following this system was ambling behind it. On the 28th of January 2002 the EU enforced Regulation (EC) 178/2002 [1] laying down the General Principles and requirements of food safety, and even later adopted very crucial EC Directive 2006/42/EC [2] for machinery which was requiring that handling, preparation processing and packaging of food is done hygienically using hygienic machinery and in hygienic premises. This regulation is still not adopted in Balkan countries and there are still no appropriate rules or guides.

Hygienic engineering is highly promoted by European Hygienic and Design group (EHEDG) which is trying to fill this gap. This guidance is especially valuable to the equipment manufacturers and users who are responsible to implement these requirements, because EHEDG provides them guidance on the essential hygienic design standards which should be in compliance with national and international legislation.

Of course there are more issues following hygienic engineering aspects like: education (formal and non-formal), technological development, innovations etc.

Key words: *Hygienic engineering, legislation, food safety, education, technological development.*

1. Introduction

Food safety systems we know today started in 1959 as single NASA program for cosmonauts safety regarding food. It took 32 years in total for HACCP system to be fully developed as we know it today. In this process were involved numerous governmental organizations and bodies, companies, associations etc. During this process many mistakes were made, but the final result was fully functional system applicable in whole food industry.

Of course that HACCP can't be implemented as self-standing system. It needs all prerequisites which today are known as GMPs and all hygiene requirements, or GHPs.

Crucial part of food safety system/standards is machinery, its design, materials for construction, hygiene requirements etc. However, there is huge gap in hygienic engineering regarding legislation, education, best practices, requirements, guidelines, standards etc.

2. Legislation

On the 28th of January 2002 the EU enforced Regulation (EC) 178/2002 [1] laying down the General Principles and requirements of food safety. Scope of this Regulation and later Regulation (EC) No 852/2004 for Hygiene of foodstuffs [3] was food safety system alone and GMPs like: Location, Premises (building exterior and interior, sanitary facilities, water/steam/ice quality & supply, Transportation & Storage, Equipment, Personnel (training, hygiene and health requirements), Sanitation and Pest control and Recall system were not integral part of it.

4 years later EU adopted EC Directive for machinery which in fact is prerequisite for previous one. It must be noted that even this Regulative was issued with the purpose to facilitate hygienic engineering and design issues it is generic and open to variety of interpretations. More details to this Directive were given by European norms EN 14159 [4] and EN 1672-2 [5] which are mandatory for the EU countries. Nevertheless, these norms are also very generic. Of course, there are number of Directives and Regulations which can be considered as auxiliary for Machinery Directive as: Regulation (EC) No 852/2004 for Hygiene of foodstuffs [3], Regulation (EC) No 1935/2004 for materials and articles intended to come into contact with food [6], Commission Directive 2007/19/EC

relating to plastic materials and articles intended to come into contact with food [7] and Council Directive 85/572/EEC laying down the list of simulants to be used for testing migration of constituents of plastic materials and articles intended to come into contact with foodstuffs [8], but they are not details specific hygienic and engineering issues which are specific regarding: type of food industry, type/s of production and processing etc.

Regarding food safety legislation, Balkan countries, including Republic of Macedonia, were and are trying to harmonize their legislation according EU and these efforts are more or less successful. This process was similar to HACCP system establishment but in condensed time frame of 10 years. The Machinery Directive is still left aside and there is very small progress.

2.1. Education

Hygienic engineering and design by its nature and purpose belongs to multidisciplinary sciences. The whole field embrace sciences as: microbiology, chemistry, physics, mathematics, mechanical engineering, food technology, civil engineering etc specifically oriented toward hygiene. Academia or formal education is not following latest development in hygienic engineering and design. This is case not only in Republic of Macedonia or Balkan region, but also in European Union and worldwide. There are many objective and subjective reasons for this, but in the nutshell that means that the students don't have an opportunity to be introduced in hygienic engineering and design.

Globally, technical sciences universities are so far satisfied with the programs they are utilizing. In these programs there are curricula's for: industrial design (which is not specific to machinery), industrial engineering and management, materials, transportation, automatics and fluids engineering, but none of them is not connected with hygiene and hygienic engineering and design. The same is the case with other sciences curricula's'.

Better examples can be found in non-formal education. There are number of courses worldwide on hygienic or sanitary design. This training is not trying to replace formal education, but to fill in the gap in the lack of appropriate academic programs and practices in this field. Speaking about Europe it is noticeable that these trainings are more accessible in western European countries as: Germany, The Netherlands, Great Britain, France, Spain etc. This speaks about the great need of spreading this type of education in eastern and south European countries.

2.2 Companies

Third and maybe most important part of hygienic engineering and design are companies. Food safety is not only legal, but also and moral obligation for companies towards consumers. This is not obligation only for food processing equipment manufacturers and food producing companies, but also to companies which are producing chemicals for cleaning and disinfection, packaging equipment companies etc. They should be the driving force of hygienic design.

The EU equipment and food producing companies are paying attention to this issue more and more. Their main problem is not having detailed legislation and enough science and practice based guidances and recommendation for hygienic engineering and design. From the other hand Balkan and south east companies are still not aware of this. The reasons are numerous: size of the companies, competition, profit, level and type of engineers' education etc. There are cases, especially in the food producing companies where high temperatures are used in production process, company owners itself or employees are designing their equipment on the basis of their opinion or production experience. In that case no hygienic design and engineering are used, but the primary goals are having cheap equipment and increased production. Sometimes and in order to lower the prices or have no expenses, company owners are assigning some of their employees to improvise so called "temporary solution" which in many cases is ending like final one. This kind of solutions and decisions are proven to be wrong leading to: malfunctions, constant repairs, inability for cleaning, food poisoning and in a few cases to fires or environmental pollution. Of course that there are companies which are taking care about the hygienic engineering, but their main problem is lack of: educated engineers (no approach to formal and non-formal education), information, legislation, guidelines etc.

2.3 Hygienic engineering and design standards, guidelines

Regardless that so far many sector specific standards on meat, milk, fish, bakery and other business have been issued, there are scarce organized efforts which are trying to embrace hygienic engineering and design for whole food sector. So far fill the only European organization which is working in this regard is European Hygienic Engineering and Design Group (EHEDG). Until now 4 EHEDG Subgroup clusters: Equipment and Components, Principles, Processing, Services and Utilities and Training and Education have issued 41 guidelines which are covering almost all food industry hygienic engineering and design aspects.

EHEDG counterpart organizations based in USA are 3-A and NSF. These 3 organizations are actively cooperating and they are example for global harmonization in guidelines and standards development.

This guidelines based on science and technology practice can be used by: national bodies in preparation of national legislation, food equipment companies in the process of design, food producer companies during processes of selection, purchasing and equipment maintenance etc.

3. Conclusions

- Food safety is legal obligation for all European countries including Balkan countries and Republic of Macedonia. However, the Machinery Directive is still left aside and there is small or no progress in its implementation.
- Academia or formal education doesn't follow the latest development in hygienic engineering and design. Better situation can be found in non-formal education. Hygienic engineering and design trainings are more accessible in western European countries. This is widely opening the doors for spreading this type of education in eastern and south European countries.
- Companies should be the driving force of hygienic design. Their main problem is not having detailed legislation and enough science and practice based guidances and recommendation for hygienic engineering and design. Balkan and south east European companies are still not aware, which leads to improvisations with results like food poisoning, low profitability, and high production costs etc.
- There is very little organization which is filing the hygienic engineering and design gap for whole food sector. On the European soil this kind of organization is European Hygienic Engineering and Design Group. Their counterparts USA organizations are 3-A and NSF. These organizations are actively cooperating and are example for global harmonization in guidelines and standards development.
- Balkan countries should speed up the process of adopting hygienic engineering and design in all aspects.

4. References

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