

# Personal hygiene awareness among food handlers

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## ABSTRACT:

In the globalization and rapid industrial development times food safety assurance is one of the basic conditions for protection of public health. For this purpose knowledge and awareness of personal hygiene among food handlers were determined in one of the middle-sized meat processing plants. It was found out that food handlers are aware of personal hygiene, but do not always practice it. Were observed problems in inter – social relations and communication difficulties at all levels, which can influence on quality of work performed and consequently on food safety assurance. Awareness of importance of good hygiene practice is based upon sense and is not uniformed. Periodicall, thematicall and methodologicall adapted trainings are crucial for food safety.

## KEY WORDS:

Food safety, Personal hygiene, Employees, Food industry

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## INTRODUCTION

Food is basic human good and need. So in this period of globalization it is very important to control food safety from “stable to table” and in accordance with legislation. From January 1<sup>st</sup>, 2006 legislation is harmonized in all European Union (EU) member states [1,2]. An obligatory tool for food safety assurance, so-called HACCP system, enables food operators to identify hazards at individual stages of technological process and to control those hazards by continuing and systematic control. The HACCP system must be based upon solid grounds – pre-requisite programs (PP). PP include hygiene programs and activities, necessary for involvement and execution of the HACCP system as an internal control in food businesses [2].

HACCP system is very structure and easy to manage, because requirements as written down in forms of strategies. It can be adjusted by every company with regard to the type and size of food business. But authors of professional and scientific papers are questioning regarding its efficiency in practical work [3,4,5,6], mainly in large and small food businesses. Important elements of HACCP systems are job satisfaction and motivation [7,8], which in food businesses are often ignored or put away. Successful companies have experienced that the biggest challenge nowadays is not developing corporate vision and defining strategies, but establishing a system, which stimulates employees to follow it [9]. Experiences in the field of human resources management have shown employees must be dealt with as whole persons. So the management must stimulate employees to work effectively. One of the ways is to motivate the employees by organizing work at operative levels [10].

### Hygiene principles and responsibilities

Food production and trade must be in accordance with principles of good practice. Responsibility for food safety is divided between food operators and each and every employee, which must performs duties according to rules.

Food operators must assure food safety in all the stages of production and trade by implemented internal HACCP-based control. Documents and records of all the stages of preparation, planning, implementation, activities, control and eventual HACCP system changes must be kept. Employees must be supervised, must be instructed, and their continuous training regarding hygiene of foodstuffs must be taken care of, according to significance of their work. For this purpose a yearly plan of specific and continuous training, which is a part of PP documentation, must be elaborated. Only persons with suitable food education or professionally trained person are allowed to work in food production and trade. At the same time they must follow the rules of good practices [2], relating to personal hygiene, health status, protective clothing, suitable footwear and prohibition (e.g. chewing, smoking, eating etc.).

The aim of the research in the selected food business was to have a total insight into employees' knowledge and awareness regarding personal hygiene while handling food.

Food operators must assure food safety in all the stages of production and trade by implemented internal HACCP-based control.



## METHODS

In the research a combination of quantitative and qualitative methods was used. The latter enables complete and deep studying, namely from both statistical and text analysis aspects. If the combination of the mentioned method is sensible was and still is a subject of many discussions in Slovenia [11]. Use of qualitative methodology enables a deep insight in experiencing and comprehension of the studied phenomenon and involves personal experiences. By the combination of quantitative and qualitative methods<sup>1</sup> it was determined how personal hygiene is experienced and comprehended by interviewed employees. Their everyday work was observed as well.

### Quantitative method

In the quantitative part of the research employees' knowledge of the HACCP system, pre-requisite programs, food safety assurance and general feeling in a company were determined by a questionnaire [12]. The questionnaire was fulfilled by 84 out of 117 production workers. The respondents fulfilled the questionnaires with presence of a researcher. It took place from July 7<sup>th</sup> till August 8<sup>th</sup>, 2006.

The research was very extensive, so in this paper only the results regarding employees' knowledge of principles of good hygiene practice in the selected food business are presented.

### Quantitative method

To gain deep insight into the discussed problems a method of structured interview and a method of observation of work practices were used. By using partly structured interviews opinions of ten workers and three food experts regarding importance of personal hygiene during food handling were determined. The importance was attached to hand-washing, understanding of the term "safe food" and trust in food safety "from stable to table". The interviews in the selected company took place on August 3<sup>rd</sup> and 4<sup>th</sup>, 2006. The results of comprehension of the terms regarding food safety and hand-washing are presented in the paper.

Observation of work practices took place from July 7<sup>th</sup> till August 8<sup>th</sup>, 2006. During observation of a working process we focused on protection during food handling, behavior of food handlers and following of good hygiene and production practices.

## RESULTS

### The questionnaire

Four questions were included in the questionnaire. The questions were related to the knowledge of principles of good hygiene practice with main stress laid upon personal hygiene during food handling.

Most of the workers use preventive when and where necessary (table 1). But quite few of them do not cover infected wounds (23.8%) or pimple (20.2%).

<sup>1</sup> The methodology and the results, which are presented in the paper, are the part of the graduation research by Špela Hajdinjak. The graduation research was carried out in Department of Department of Sanitary Engineering of College of Health Studies in Ljubljana.

By the combination of quantitative and qualitative methods it was determined how personal hygiene is experienced and comprehended by interviewed employees.

**Table 1.**

Use of protective clothing during food handling.

During food handling I cover...	n	Yes /%	No /%
... mustache, beard and long hair with a hair net.	83	96.4	2.4
... plaster placed over a wound with gloves.	82	94.0	3.6
... nail polish – with gloves.	79	75.0	19.0
... a short hair – with a head covering.	82	94.0	2.4
... a pimple – with a plaster.	80	75.0	20.2
... hand jewelry - with gloves.	80	77.4	17.9
... infected wounds – with a plaster or a bandage.	82	72.6	23.8

A gender of the respondents significantly ( $p < 0,05$ ) influences the statements “During food handling I cover nail polish with gloves”, “hand jewelry with gloves”, “infected wounds with a plaster or gloves”. A difference between the respondents, who cover nail polish and hand jewelry and those, who doesn't is higher among men than in among women. Women covered infected wounds with a plaster in a higher degree compared with men.

The majority of the employees answered that in cases of diarrhea, vomiting, fever etc. they do not handle food (table 2).

**Table 2.**

Health status of employees and employee involvement in the working process.

I handle food, when I ...	n	Yes /%	No /%
... have diarrhea.	84	1.2	98.8
... feel dizzy.	84	20.2	79.8
... have a cold.	84	3.6	96.4
... am exhausted.	83	33.3	65.5
... cough.	83	8.3	90.5
... have a high body temperature.	84	9.5	90.5
... vomit.	84	0.0	100.0
... cut myself.	84	13.1	86.9

24 different combinations of answers were determined by the analysis of the answers to a question: “What do you think are the three types of inconsideration of hygiene principles, which directly influence food safety?”. The respondents could choose among ten possible activities. The results are shown in table 3.

The respondents chose this combination of answers (1) “I don't wear head-covering” most frequently (29.5%), (3) “I wash my hands after using the toilet” and (6) “I use dirty working utensils”. All the answer, which could not be ranged into none of the most frequent combinations of answers and were answered infrequently were joined in a group “other”.



Hygiene principles, which directly influence food safety.

**Table 3.**

Combinations of answers	%
1, 3, 6	29.5
3, 5, 6	14.1
3, 4, 6	8.9
1, 2, 3	7.7
3, 5, 10	5.1
Other	34.7

**Legend:** 1 – “I don't wear head-covering”, 2 – “I wear jewelry during food handling”, 3 – “I wash my hands after using the toilet”, 4 – “I don't have clean overall”, 5 – “I forget to clean my work place”, 6 – “I use dirty working utensils”, 7 – “I chew while working”, 8 – “I wear nail polish”, 9 – “My protective footwear is dirty”, 10 – “I've forgotten to clean a refrigerator”.

The employees' knowledge of HACCP system and pre-requisite programs was determined by a question regarding factors, which are, according to employees' opinion, the least important for food safety (table 4). The results show that employees think personal hygiene is one of the most important factors for food safety, because only 1.2% of them believe that personal hygiene do not influence food safety.

Factors, which according to workers influence food safety.

**Table 4.**

For food safety I think it is important to...	%
... measure a food temperature.	2.4
... check the date of durability.	4.8
... check food quality.	27.4
... follow personal hygiene principles.	1.2
... assure suitable working conditions.	17.9
... check a concentration of a cleanser.	19.0
... measure an air temperature in cold warehouses.	3.6
... record measured and read parameters.	20.2

According to respondents' opinion quality control of foodstuffs (27.4%), control of cleanser concentrations (19.0%) and suitable working conditions (17.9%) are less important for food safety. Employees don't see the importance of recording measured or read parameters (29.2%)

### The partly structured interview

Connections between laic and technical definition of the term “safe food” were assessed by the content analysis of the respondents' answers. The statements with similar contents were joined into categories, which were named as associations. The definition written in the Act Regulating the Sanitary Suitability of Foodstuff, Products and Materials Coming into Contact with Foodstuffs was used as a base for a technical definition of the term “food safety”. In the Act food safety is defined as follows: “food safety is assurance that foodstuff is not harmful for human health, if prepared or used for its intended purpose [13]. As an acceptable answers were considered statements like e.g. “safe for consumer”, “healthy” or “not harmful”. All the other answers were deter-

mined as incorrect. It was found out that only one respondent explained the term “safe food” complexly and came near to the technical definition of the term. The results evidently show the majority of the respondents relate the term safe food to a health hazard (61.5%). The rest of them connect safe food with health (15.4%) and a working process (15.4% (table 5). Only one respondent mentioned control as well.

Mark	Association	n (%)
A	Hazard	8 (61.5)
B	Health	2 (15.4)
C	Working process	2 (15.4)
D	Control	1 (7.7)

The next question to the employees was what was their first thought when they heard the expression “wearing of overalls is obligatory” and what is their relation to it. The results showed that all of the employees are aware of the importance of wearing overalls, because they believe wearing overalls is necessary and obligatory. The respondents’ opinion is that the main purpose of wearing overalls is personal protection and that food protection is secondary.

Opinions regarding hand-washing were determined afterwards. The respondents were first questioned what they thought of when they heard the term “hand-washing”. Most of the respondents they think of hygiene and quality (30.8%). Two respondents connected hand-washing with protection or protection and hygiene (table 6).

Mark	Association	n (%)
A	Hygiene	7 (53.8)
B	Quality	4 (30.8)
C	Protection	1 (7.7)
A+B	Protection and quality	1 (7.7)

### Observing

For the results of observation it is necessary to stress out that deficiencies were determined for individual persons and the results can not be concluded for all the employees in general.

### Protective clothing

- All production workers used protective clothing and equipment required for production process.
- Women did not use disposable head-coverings properly, because hair is not completely restrained.
- In the past men wore caps made of cloth (baseball caps). Some of the workers still keep the caps in their lockers, although it is not allowed. Some of them still use the caps instead disposable head-coverings.

**Table 5.**

Content analysis of answers employees had, when asked to define the term “food safety”.

**Table 6.**

Analysis of what were employees’ first thoughts, when they heard an expression “hand washing”.

Observation of the working processed showed that irregularities in hair coverings are even more frequent as showed by the results of interviews.

- Workers from the micro-confection department did not dispose face mask and gloves in the marked waste basket when leaving the room.
- Some of them didn't change overalls during work, although they were already dirty.
- During inspection of area and equipment in the cutting department a worker from micro-infection was momentary present. There was a possibility of cross-contamination because workers could move from high to low risk areas and back and forgot to change their clothes at the same time. They forgot the hygiene barrier is essential.

### Hand-washing

- During our observation there was nobody passing by hygiene barrier. Two workers were randomly selected and wet swabs for hand hygiene were taken from their hands. Results of microbiological analysis did not show presence of pathogenic bacteria.
- Workers wash and disinfect their hands at hygiene barrier located at the entrance, but didn't do the same when entering the production area, although they should.
- When drivers entered the dispatch area, they didn't use the hygiene barrier located at the entrance, although the latter are located at every entrance. They didn't use disposable head-coverings as well.

### Other hygiene and/or irregularities

- During veterinary inspection a worker had to leave his work place, because his beard was not properly tidy.
- On of the female workers wore too much make-up, although a supervisor warned her.
- Workers, who wore ring during work didn't use disposable gloves.
- Some of the production workers do not follow ban rules (e.g. chewing, eating).

## DISCUSSION

The results of interviews and observation of working process show a slightly inconsistent following of GHP principles and employees' awareness of the latter. The interview analysis showed that 2.4% of respondents do not cover mustaches, beard or long hair with a hair net and that 2.4% food handlers do not cover short hair with a head-covering. Observation of the working processed showed that irregularities in hair coverings are even more frequent as showed by the results of interviews. Hair may be contaminated with numerous micro-organisms and dirt (e.g. dust, dandruff), which can be transmitted on foodstuffs, so principle of not touching is very important [14]. Some of the workers wear jewelry while handling food and do not use disposable gloves. Some of them use disposable gloves, but do not change them according to principles of good hygiene practice. Microorganisms under jewelry worn by workers can not

be washed away during hand-washing, which increases a possibility of food contamination [14]. A negative thinking of good hygiene practice among workers was not noticed. Similar findings are stated by some other authors, too [15,16]. A negative thinking of the HACCP system was clearly presented in a qualitative study, which included an owner of a small farm in Great Britain. He thought that HACCP system is a “bureaucratic nightmare” and that recording of performed activities does not influence food safety [4], which was also the case in almost the third of answers of the respondents in the presented research.

During observation of the working process bad mutual relationships and communication problems between workers and some of the supervisors were seen. Too authoritative attitude towards all the employees was noticed, as well. The mentioned troubles result in inferior feelings among employees, which de-motivate them. This can significantly influence work aiming food safety. The mentioned fields of human resource management and management techniques should be adopted by management and experts in food businesses through training.

## CONCLUSION

Food safety is a responsibility of both the management and the food handlers. Therefore their knowledge, awareness and behavior are crucial for food safety assurance. Beside improperly planned trainings about good hygiene practice and good production practice, bad mutual relationships, communication problems, authoritative attitude and lack of motivational approaches are the reasons for unsuitable behavior of employees. The majority of the respondents show a positive attitude towards the HACCP system and good practices, which is also reflected in their work, but there are still some individuals, who do not follow rules. By observing the working process it was determined that employees are aware of their faults, but nevertheless repeat them. So awareness of the problems remains at level of reasonable comprehension, but it is still not incorporated into practical work. Food safety management is not limited to identifying and estimation of hazards, but includes their control as well. The responsible persons have an important task to establish an effective communication among co-workers both vertically and horizontally, to prepare effective and specific trainings for employees and to find ways for motivating both individuals and groups. To improve hygiene in a company a positive attitude of all employees is important. Motivation is important as well, because it influences workers attitude towards their work, their superiors and towards a company.

HACCP system is a strategy of food safety assurance and requires adjustment of a process regarding size and volume of a food business. A comprehension of system's and legislative requirements by the responsible persons, who are often unmotivated or have insufficient knowledge regarding food safety, is important. A total food safety management should be oriented to constant improvement, which would influence training of employees and managing system requirements and employees' attitude towards work.

HACCP system is a strategy of food safety assurance and requires adjustment of a process regarding size and volume of a food business.

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