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PERSONAL HYGIENE EVALUATION OF THE EMPLOYEES HANDS IN DAIRY PROCESSING PLANT

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ABSTRACT

Food safety in the production of milk and dairy products is a priority of the dairy industry. The study is focused on the evaluation of the hand hygienic level of selected employees working in the dairy processing plant using the fingerprint method. The fingerprint method was performed on the evaluated employees before as well as after disinfection of hands with antibacterial soap and during the production process on solid agar medium in a Petri dish. From solid agars was used Meat peptone agare, Endo agar which were evaluated after 24 hours cultivation at 37°C. In our study found out, Prosavon antibacterial soap was effective on hands at all evaluated persons with exception a cottage cheese production worker at whom we detected contamination of both hands. After disinfection of the right hand, we detected 22 CFU of the total number of microorganisms and 5 CFU of coliform bacteria, and after disinfection of the left hand, we detected 14 CFU of the total number of microorganisms and 3 CFU of coliform bacteria. During production, we detected 23 CFU of the total number of microorganisms and 6 CFU of coliform bacteria on the right hand of a cottage cheese production worker and on his left hand we detected 15 CFU of the total number of microorganisms and 4 CFU of coliform bacteria. Based on our results obtained in practical conditions it can be presented following that regularly washing hands with Prosavon antibacterial soap is a simple but at the same time the most important procedure from terms of hand hygiene and prevention before foodborne diseases.

KEYWORDS: hand hygiene, disinfection, Prosavon, employees, dairy processing plant.

INTRODUCTION

Humans are a potential source of micro-organisms that can be transmitted and multiplied by food and that can cause disease to others.[1]

Hand hygiene is the most basic yet critical criterion for ensuring safe food handling by food handlers. In fact, hand washing has long been known as a basic preventive measure.[2,3,4,5]

Humans actively transmit dangerous microorganisms by moving in different places and touching different objects. They can transmit bacteria, viruses, parasites and microscopic fungi to food or to food contact surfaces by hand.[6]

Many studies indicate that various bacteria, including *Escherichia coli*, *Staphylococcus aureus* and *Salmonella sp.* they survive on hands, tools, clothes, kitchen utensils and their viability lasts hours or days after initial contact with microorganisms.[7]

Food products are a very good environment for the growth and multiplication of microorganisms. It easily could lead to an increase in the microflora, which causes spoilage, as well as microflora, which may be the source of consumer health problems.[8]

It is necessary to comply with the prescribed standard of personal hygiene in terms of prevention of foodborne infections. Employees who come into contact and handle food must wash their hands constantly and thoroughly with a suitable disinfectant under running lukewarm water.[9]

Ordinary (detergent) soaps together with water mechanically remove a certain amount of microorganisms, but disinfectants are necessary to kill or inhibit their growth.[10]

The work is focused on the evaluation of personal hygiene of the employees hands in dairy processing plant before disinfection of hands, after disinfection and during the production process using the fingerprint method.

MATERIAL AND METHOD

The study was practiced in an environment of a dairy processing plant located in Eastern Slovakia. The level of personal hygiene was assessed for employees working in the part of cheese production worker, yoghurt production worker and cottage cheese production worker

in a dairy processing plant. We evaluated hand hygiene of employees working in dairy processing plant using the fingerprint method and the effectiveness of liquid soap Prosavon with antibactrial effect, which employees use to disinfect their hands (Figure 1).

The impression method was performed on the evaluated employees before and after disinfection of hands with antibacterial soap and during the production process on solid agar medium in a Petri dish. From solid agars were used Meat peptone agar (MPA), Endo agar (EA), which were evaluated after 24 hours cultivation at 37 °C. The results of the total number of bacteria and coliform bacteria were evaluated in CFU (colony forming units).

Prosavon antibacterial soap significantly reduces the occurrence of bacteria and prevents excessive drying of the skin. It contains the active ingredients Chlorhexidine Digluconate, o-Phenylphenol. The product is used undiluted. A sufficient amount of the product is applied to the moistened skin, rubbed and foamed to form water. After 20 seconds, the skin is rinsed with warm water. Prosavon is a gentle liquid washing emulsion with antibacterial additives intended for hand care, especially in operations where increased demands are placed on cleanliness. The manufacturer of Prosavon is Schülke CZ, s.r.o.

Figure 1: Evaluation of hand hygiene using the fingerprint method.

RESULTS AND DISCUSSION

It is well known that food has a direct impact on human health and must therefore meet his needs and must in no way endanger his health.

Food workers who are in direct contact with raw materials, semi-finished products, finished products in the food production process during the storage, transport and placing must unconditionally observe all principles of personal hygiene, including hygiene principles in the performance of their work and principles for the use of prescribed protective equipment.[11]

Hand washing for food workers is the key to protecting against microbes and their spread, as they are a source of foodborne diseases and food poisoning.

In the monitored milk processing plant, we evaluated the hygienic level of the hands of selected employees using the fingerprint method and evaluated the disinfection efficiency of the antibacterial soap Prosavon, which is used to disinfect the hands of employees working in the dairy plant. Prosavon antibacterial soap intended for hygienic hand treatment was sufficiently effective on the hands of all evaluated employees, except for the hands of the cottage cheese production worker. At the cottage cheese production worker, we detected on his right hand 22 CFU of total numbers of microorganisms and 5 CFU of coliform bacteria after disinfection. After disinfection of the left hand, 14 CFU of total numbers of microorganisms and 3 CFU of coliform bacteria were detected. During production, we detected 23 CFU of the total number of microorganisms and 6 CFU of coliform bacteria on the right hand of a cottage cheese production worker and on his left hand we detected 15 CFU of the total number of microorganisms and 4 CFU of coliform bacteria.

Table 1: Evaluation of Prosavon efficacy before, after hand disinfection and during the production process.

Personnel	Sampling site	Agars			
		MPA		EA	
		right hand	left hand	right hand	left hand
cheese production worker	before disinfection	65	25	0	0
	after disinfection	3	0	0	0
	during the production process	3	0	0	0
yoghurt production worker	before disinfection	30	10	0	0
	after disinfection	0	0	0	0
	during the production process	0	0	0	0
cottage cheese production worker	before disinfection	85	52	15	5
	after disinfection	22	14	5	3
	during the production process	23	15	6	4

Secondary contamination of food occurs during the production process from the environment, from the hands of workers, from machinery and equipment.[11]

Additionally, food workers' poor personal hygiene is an important contributor to foodborne illness outbreaks.[12,13] Precisely for this reason it is important to monitor the hygienic level of the hands of employees working in food operations.

CONCLUSION

In our study, we focused on the evaluation of the hygienic level of the hands of employees working in the dairy plant and the evaluation of the disinfection efficiency of the antibacterial soap Prosavon. Disinfectant was effective on hands at all evaluated persons with exception cottage cheese production worker, at whom we detected total numbers of bacteria and coliform bacteria on both hands after disinfection. The cottage cheese production worker had not only dirty both hands after disinfection but also during the production process. Poor hand hygiene results at this worker indicate insufficient hand washing and poorly performed hand washing techniques.

From the obtained results we can conclude that the suitable choice of disinfectant with a correctly performed hand washing technique is of great importance in terms of food safety. Food handlers play a crucial role in preventing foodborne diseases.

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