JAP&T
TPA-Timişoara

Available online at www.japt.tpa.usab-tm.ro

Journal of Agroalimentary Processes and Technologies 14(2) 2008, 414-416

Journal of Agroalimentary Processes and Technologies

The sanitation efficiency control in a meat processing factory

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Abstract

Because meat and meat products represent good culture medium for microorganisms, the obtaining of healthy products requires an efficient sanitation made by standard proceedings. The goal of the study was to establish the sanitation efficiency by microbiological examination in a meat processing factory from Timişoara. To check the sanitation efficiency, there were sampled from: walls, floor, work desks, transport containers, knives, hatchets, saws, cuter, kneader, workers protection equipment and workers hands. The samples were prelevated before and after sanitation and there were determined units colonies forming (UFC) and coliforms according legislation. From the results it can be observed that, even after sanitation, excepting hatchets and faience walls, on all other studied objectives UFC was high and coliforms, excepting hatchets and faience walls, were, also, present on all studied objectives. In conclusion, we can say that the presence of microbial contamination after sanitation on some studied objectives from this meat processing factory is due to the lack of some utilities (knives disinfector, permanent warm water source at 83°C) and to the bad management concerning sanitation operations.

Keywords: meat processing, sanitation efficiency

1. Introduction

The meat represents the main protein source for human. Because meat and meat products are fine culture medium for microorganisms, the processing, storing, transport and commercialization must be done in rigorous hygienic conditions, in order to prevent microbiological contamination and spoilage of products.

Salubrious products obtaining requires an efficiently sanitation, based on standard procedures with practical references to washing and sanitation techniques for rooms, equipment and facilities used in processing and personal hygiene(1).

Sanitation efficiency and hygienic conditions examination for food industry is done with microbiological procedures in laboratory to highlight some markers.

In our country, the determination of sanitation activities efficiency in food processing and distribution units is regularized by Health Department Decree Nr. 976/1998 and of some instructions and programs elaborated and emitted by Sanitary and Veterinary National Agency of Agriculture Department.

The goal of the study was to establish the sanitation efficiency by microbiological standard examination. The objectives consist in quantification of total number of aerobe mezofile germs (NTGMA) and coliforme bacteria, according to the active legislation methods (2, 3).

2. Materials and method

For sanitation, the company uses DEOSEPT product which is a cationic surfactant 4%, the rest to 100% are nonionic surfactants.

The product has bactericide, fungicide and virulicide properties upon a various

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microbial flora (Escherichia coli, Aspergillus spp., Penicillium spp., Sacharomices cerevisiae, Staphylococcus aureus, Streptococcus pyogenes, Proteus vulgaris, Shigella spp., Trichophyton interdigitale, Candida albicans, various viruses).

It is used for cleaning and disinfection of various surfaces (sandstone, faience, plastics, metal, glass), to inhibit mold growth and to eliminate the specific smell due to these.

Before use, it is prepared a fresh solution 2.5% by dissolving 25 ml in 1000 ml water. For cleaning, disinfection, deodorization, the solution is applied on surfaces by pulverization. In order to eliminate the molds, the solution is applied in the places where it was noticed the presence of molds (walls, floors). The solution is left to act 30 minutes, after that the surface is rinsed with water and another quantity of solution is applied and left to dry. It is applied weekly or when new spots of molds appear again.

To verify the efficiency of sanitation, there were taken sanitation samples three times from knives, hatchets, saw, floors, plastic work tables, faience, transporting tanks, stainless steel table, cuter, blender, plastic coffrets, workers' protection equipment and hands.

The sampling was done before and after disinfection.

Sanitation samples were taken from a 100 cm^2 surface with sterile blotters, passing the blotter three times over the same surface.

Sanitation samples were immersed in 9 cm^3 of peptonated physiological solution.

3. Results and discussion

Examined objects microbial load, before and after sanitation, is presented in table 1. The presented values are the arithmetical average of the three determinations.

The presented data highlight that before sanitation, the values that show the general contamination expressed by NTGMA were ranged between $11*10^3$ UFC/cm^2 for faience and $250*10^4$ UFC/cm^2 for cuter.

Coliforme bacteria before sanitation were present on all examined objects and were ranged between $50*10^2$ UFC/10 cm^2 for processing room faience and $175*10^4$ UFC/10 cm^2 for cuter.

After sanitation, excepting hatchet and rashing room faience on which the bacteria were not found, on the other studied objects, NTGMA values were ranged between 80 UFC/cm^2 and $144*10^3$ UFC/cm^2. The highest value was determined on cuter, and the lowest one on the blender.

The coliforme bacteria were present after sanitation on knives, saw, sacrifice room floor, rash work table, plastic work table, transporting tanks, stainless steel table, cuter, plastic coffrets, processing room faience and workers' protection equipment and hands.

The presence of coliforme bacteria is not allowed by active legislation.

For NTGMA the active legislation admits a maximum of 2 UFC/cm^2.

It was observed that, after sanitation, the presence of microbial contamination is due to inadequate cleaning and disinfection procedures and to wrong concentration of the cleaning substance and contact time. More, the unit does not have some indispensable facilities for technologic process: knives disinfector and a permanent source of hot water (83^0C).

The applying of adequate hygiene measures in food industry requires the providing of a material reserve that supplement production costs. These costs are balanced with the superior quality of products and with reducing or even eliminating eventual confiscations.

Unfortunately, the most irregularities that are due to sanitary quality of food are not attended of alimentary substrate modification, so they cannot be observed with senses. The laboratory, along with the engineer's and veterinary's supervision over the whole production flow, from new

born animal to final product ready to consumed, are today the main instruments for sanitary protection of food products.

The issues regarding the consumer's security lead automatically to aspects that regard the way how the food products are processed, the biological, chemical and physical hazards that might represent a risk for health and life.

The consumers are legitimated to expect that the food products they are consuming are health and safe for alimentation, the decay caused by food is unpleasant and worse, might be fatale.

Table 1. Examined objects microbial load before and after sanitation

Specification	**Microbial load before sanitation**		**Microbial load after sanitation**		**Normal corresponding values**	
	NTGMA/cm^2	**Coliforme bacteria/10 cm^2**	**NTGMA/cm^2**	**Coliforme bacteria/10 cm^2**	**NTGMA/cm^2**	**Coliforme bacteria/10 cm^2**
Knives	$64x10^3$	$12x10^3$	$104x10^2$	$24x10^2$	2	Absent
Hatchet	$71x10^3$	$11x10^3$	0	0	2	Absent
Saw	$111x10^3$	$126x10^3$	$226x10^2$	200	2	Absent
Sacrifice room floor	$430x10^3$	$402x10^3$	300	300	-	-
Plastic work table	$516x10^3$	$41x10^3$	164	56	2	Absent
Rashing work table	$470x10^2$	$172x10^2$	170x10	$10x10^2$	2	Absent
Rashing room faience	$223x10^4$	$317x10^3$	0	0	-	-
Transporting tanks	$168x10^4$	$10x10^3$	$77x10^2$	100	2	Absent
Stainless steel table	$420x10^3$	$210x10^3$	$136x10^3$	$224x10^2$	2	Absent
Cuter	$270x10^4$	$175x10^4$	$144x10^3$	$2x10^3$	2	Absent
Blender	$86x10^3$	$56x10^3$	80		2	Absent
Plastic coffrets	$63x10^3$	$46x10^3$	$6.3x10^2$	$5.1x10^2$	2	Absent
Processing room faience	$11x10^3$	$50x10^2$	$121x10^2$	150	-	-
Workers' protection equipment	$127x10^3$	$224x10^2$	120x10	70	2	Absent
Workers' hands	$53x10^3$	$94x10^2$	$119x10^2$	$30x10^2$	-	-

4. Conclusion

The presence of microbial contamination after sanitation on most examined objects is due to:

- inadequate cleaning and disinfection procedures (wrong concentration of the cleaning substance and contact time);
- the absence of some utilities (knives disinfector and a permanent source of hot water (83^0C)).

References

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