

HYGIENIC STUDY IN MEAT INDUSTRY IN CZECH REPUBLIC

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SUMMARY

Food hygiene in meat industry comprises safety measures and conditions for production, processing, storing and sale of meat products in order to ensure their sanitary and hygienic harmless. In our work we studied risks of contaminations coming from equipment, working devices rooms and staff personal. The sandwich method HYGICULT was used to test working hygiene. All results served to determine the degree of microbiological contaminations in meat factories and shops. Microtests as ENTERO-TEST, STAPHY-TEST and NEFERM-TEST (Lachema, Brno, CR) were carried out to improve better identifications of isolated species. The strains *Pseudomonas* and *Escherichia Coli* were present as predominant contaminants on the surface of carcasses. The higher surface contamination of the strains *Staphylococcus* and *Pseudomonas* (more than 100 CFU/sq. cm) was determined in the phase of production. From our investigations, it could be concluded that *Staphylococcus*, *Citrobacter* and *Enterobacter* are often present as bacterial contaminants in shops.

Food hygiene in meat industry comprises safety measures and special conditions for production, processing, storing and sale of meat products in order to ensure their sanitary and hygienic harmless and biological value, respectively. Such important goals require to keep the following hygienic chain- personal, working and environmental hygiene.

In our work we studied different levels of personal and working hygiene. In fact we examined the observance of two hygienic measures, e.g. a sufficient cleaning and a reliable disinfection, respectively. The neglect of such measures has a negative influence on the whole quality of final meat products, mainly their shellives.

Materials and methods

We used the sandwich method HYGICULT TBC (Finland) for examinations of microbiological contaminations in some Czech meat factories and shops. This routine semiquantitative and rapid test is very suitable for total bacterial count but not valuable for higher bacterial concentrations (more than 100 CFU/sq. cm). After taking of sandwiches samples were incubated 2 days at 35 degrees C.

Colonies were counted and TBC (total bacterial count) compared with the schedule to determine contaminations per squared cm (CFU/sq. cm). Colonies were also isolated on Endo agar, BPLS agar and blood agar. Next day catalase test, Gram coloured preparations and if necessary STAPHY-TEST or STREPT-TEST (LACHEMA, Brno, CR) were carried out. Moreover colonies from BPLS and Endo agar plates served for cytochromoxidase tests. NEFERM-TEST or ENTERO RAPID TEST helped us for next better identifications of bacterial species. Results of all tests were evaluated by using of special PC software.

Results and discussion

Our results can be divided into two groups. The first one comprises results from carcasses (after slaughtering). After quantitative evaluations we found out the surface contaminations were very different, e.g. from 10 CFU/sq. cm to higher than 100 CFU/sq. cm. There were no differences of the level of contaminations on skinned or unskinned carcasses. But we believe the significant differences depend on the personal attitude of staff in meat industry to keep hygiene during the processing, e.g. good technology practice (GTP). The predominant bacteria of the carcass surfaces were *Pseudomonas*, aerobic sporulates and *Escherichia Coli*.

The highest contaminations more than 100 CFU/sq. cm were detected in muscles in the production phase and the predominant bacteria were the same as in the processing phase. We focused our attention on the second group of samples in this phase, e.g. sandwiches from staff overalls and production surfaces. The contaminations of these samples were very high - more than 100 CFU/sq. cm. We evaluated isolated contaminants as aerobic sporulates, *Staphylococcus epidermidis*, *Staph. carnosus* and *Staph. caprae*.

In the phase of sale we found high contaminations of working devices and surfaces. We diagnosed *Enterobacteriaceae* in a wide variety (strains *Citrobacter* and *Enterobacter*) and *Staphylococcus epidermidis*.

Conclusion

We can conclude that HYGICULT TPC is easy and rapid to use it for bacterial surface contaminations in meat industry and sale. It has a sufficient semiquantitative value for evaluations of results, eventually for quantitative evaluations of sandwich samples.

References

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