# HYGIENE MONITORING IN STYRIAN SLAUGHTERHOUSES

Köfer, J., Pless, P.
Department of Veterinary Administration in Styria, Zimmerplatzgasse 15, 8010 Graz, Austria

## Background

Rules for regular checks on the general hygiene carried out by slaughterhouse operators according to Directive 64/433/EEC on health conditions for the production and marketing of fresh meat and Directive 71/118/EEC on health problems affecting the production and placing on the market of fresh poultry meat will be implemented in national law (Decree on the Hygiene of Fresh Meat, Frischfleischhygieneverordnung, BGBl. 1994/396 i.d.F.) as of 1 July 2002. Pursuant to this amendment slaughterhouses will be obliged to put in place a HACCP system, to perform regular bacteriological checks of cleaning and disinfection and to carry out bacteriological tests on carcasses. Detailed requirements for samples, sampling procedures, analysis, testing criteria and documentation have for the first time been specified for microbiological tests on carcasses of pigs, cattle and small ruminants.

## Objectives

The study was aimed at preparing some of the slaughterhouses licensed for intra-Community trade for the implementation of the amendment of the Decree on the Hygiene of Fresh Meat in July 2002 by analysing the hygiene status of the carcasses. The programme will be continued and serves to verify the results obtained within the scope of the in-house self-inspections carried out by the establishments.

## Material and Methods

The largest five pig, seven cattle and three chicken slaughterhouses were selected for the investigation. Samples were taken on a quarterly basis from January to December 2001. About half way through the slaughtering process, four surface samples (pieces of rind of 20 $cm^2$ each from neck, shoulder, belly and leg) were taken from five pig carcasses and five surface samples (neck, shoulder, brisket, flank and leg) were taken from five cattle carcasses by means of a destructive sampling process (ÖNORM DIN 10112). The samples were pooled into a composite sample, cooled in a stomacher bag and sent to the Quality Control Laboratory of the Department 8 C - Veterinary Administration - of the Styrian Government for further analysis. The skin samples of chicken carcasses, 20 $cm^2$ from the breast and back, were taken at the laboratory.
The parameters for analysis can be divided into the total viable count of aerobic mesophiles (ÖNORM DIN 10161), Enterobacteriaceae (ÖNORM DIN 10164), *E. coli* (Coli-ID agar, Biomerieux 42017) and enterococci (ÖNORM DIN 10106) and coagulase-positive staphylococci (Baird-Parker/RPF agar; ÖNORM DIN 10163-1).
The acceptable range for the total viable count of aerobic mesophiles and the Enterobacteriaceae count is log 3.5 and 1.5, respectively, for cattle and log 4.0 and log 2.0, respectively, for pigs. No limits have so far been specified for chicken carcasses.

## Results and discussion

The bacterial count measured on pig carcasses in five Styrian pig slaughterhouses showed that two establishments clearly exceeded the acceptable range (up to 5 cfu/$cm^2$) at the beginning of the investigations. Contrary to the high total viable count, the Enterobacteriaceae content in one establishment was below the detection limit of log 1 cfu/$cm^2$ in practically all tests. After a thorough analysis of the slaughtering process (Smulders et al., 2000) targeted improvement measures were taken in the dressing of the carcasses (singeing, trimming) and the line speed was adapted, thus reducing the total viable count of the carcasses to below log 4.0 cfu/$cm^2$ in both establishments (Fig. 1-4).
The bacterial count determined for the cattle carcasses showed a very satisfactory picture both in terms of the total viable count and Enterobacteriaceae content. Only one establishment continuously exceeded the acceptable range of log 3,5 cfu/$cm^2$ for the total viable count and of log 1.5 $cm^2$ for the Enterobacteriaceae count in all four test series.
Two of the three chicken slaughterhouses included in the investigation programme showed total viable counts that were constantly below log 4 (acceptable bacterial count ranges have not been stipulated yet). The Enterobacteriaceae count was in the range of log 2,5 cfu/$cm^2$ for all three establishments.

## Conclusions

The constant process control that will become necessary as a result of the amendment of the Decree on the Hygiene of Fresh Meat requires all slaughterhouses to take a great step towards the implementation of in-house self-inspection schemes on the basis of a quality management system. The Department 8C - Veterinary Administration has tried to support the slaughterhouses in the implementation of the new tasks on the basis of preliminary analyses and statistical process control measures (Dura et al., 1998).

## Pertinent literature

Smulders, F., Upmann, M. (2000): Verminderung der bakteriellen Belastung auf frischem Fleisch. 2. Beherrschung mikrobieller Risiken bei der Fleischgewinnung und –bearbeitung. Fleischwirtsch. 80 (10), 18 – 20.
Dura, U., Meyer, K., Untermann, F. (1998): Mikrobiologische Untersuchung von Schlachttierkörpern als Vorlaufanalyse einer statistischen Prozesslenkung im Rahmen der betrieblichen Eigenkontrolle. Fleischwirtsch. 78 (12), 1250 – 1253.

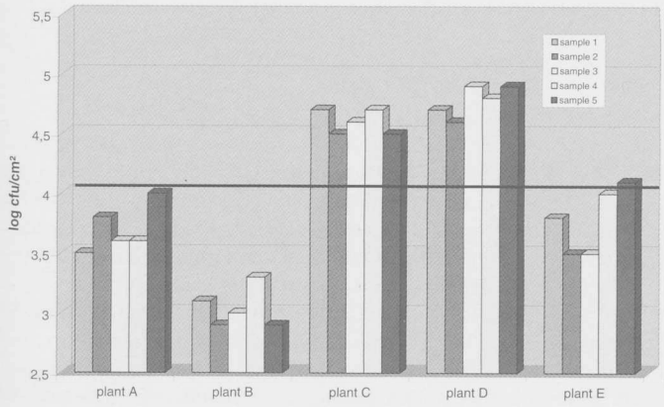


Fig. 1: total viable count of aerobic mesophiles on pig carcasses – 1st quarter 2001

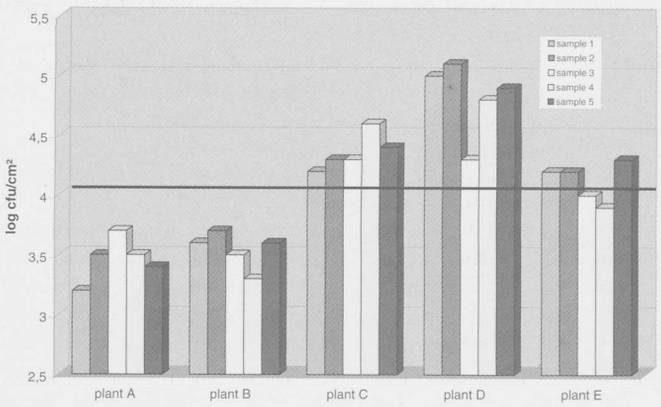


Fig. 2: total viable count of aerobic mesophiles on pig carcasses – 2nd quarter 2001

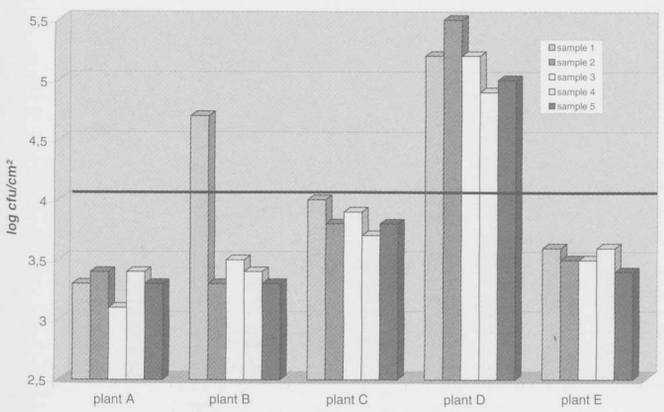


Fig. 3: total viable count of aerobic mesophiles on pig carcasses – 3rd quarter 2001

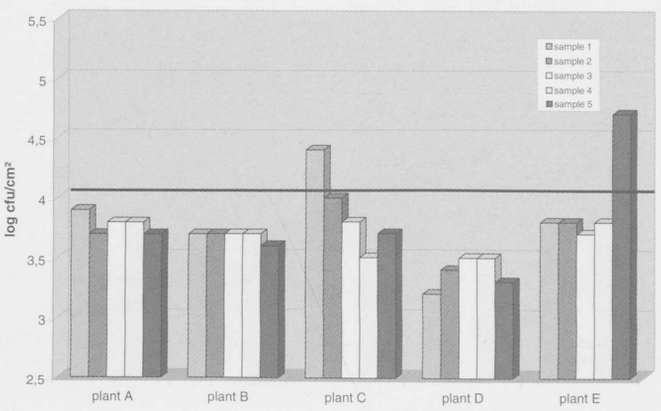


Fig. 4: total viable count of aerobic mesophiles on pig carcasses – 4th quarter 2001