

Motivation and other determinants of workers' hygienic practices - an empirical investigation

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1. INTRODUCTION

Much research has been carried out into the mechanisms of bacterial contamination of carcasses during slaughter. Although Ingram and Roberts (1976) concluded that changes in slaughter methods and hygienic practices result in little improvement of the bacterial condition of carcasses, recent reports indicate that meanwhile progress has been made. The results of some studies, for instance, stress the importance of the *cleanness of the slaughtermachinery*, which has direct contact with carcass-surfaces (Prost & Libelt-1972, Snijders-1976, Snijders & Gerats-1976, Schmeltzer et al-1979, 1980a, Gerats et al-1981). In pig slaughterlines, the cleanness of the blackscraping- and polishing machinery proved to be an important factor with regard to the bacterial contamination of the carcasses before starting evisceration procedures (Snijders-1976, Gerats et al-1981). These results indicate the necessity of a regular and efficient cleaning and disinfection of the slaughter machinery.

The bacterial condition of *dehided* carcasses proved to be caused mainly by contacts of the dehided surfaces with the hide. Therefore, these contacts and also the spraying of partly dehided carcasses with water should be avoided (Hess & Lott-1970, Nottingham et al-1974, Newton et al-1978, Steiner-1981, Stolle-1981).

Besides these sources of bacterial contamination, two other sources of bacterial contamination *during evisceration* should be distinguished. The first of these, is to be found in *faulty slaughterprocedures* during evisceration. Particularly carcass cutting and removal of intestines are very important in this respect. Faecal contaminations, as a result of intestinal injuries, lead to a marked increase of the numbers of cfu of *Enterobacteriaceae* on the carcasses. In addition, the workers' *hygienic practices* in the slaughterline are of great importance. Cross-contaminations mainly originate from hands, aprons, knives and other slaughter tools (Labadie et al-1977, Peel & Simmons-1978, Mackey et al-1979, Schmeltzer et al-1980b, Roberts-1980, Gerats et al-1981). Some data strongly indicate the role of the workers' hands as sources of cross-contamination (Seligmann & Rosenbluth-1975, de Wit & Kampelmacher-1981). These mechanisms of bacterial contamination of carcasses also apply to contaminations with enteropathogenic types of bacteria, such as salmonellae (Snijders & Gerats-1982).

Substantiating the earlier data, the results of a number of experiments showed an improvement of the bacterial condition of carcasses after introduction of improved slaughter procedures and -hygienic practices in the slaughterline (Hess & Lott-1970, Catsaras et al-1974, Childers et al-1974, 1977, Smulders et al-1982). However, these improvements of slaughterprocedures and hygienic practices were accomplished under *experimental*- and sometimes even 'laboratory' or 'test-room'-conditions. None of these experiments resulted in conclusions with respect to the realization of a more *permanent* improvement of, especially, hygienic practices of workers in slaughterlines. In this specific field, only *speculations* were found, especially regarding the influence of a.o. training, mentality, cleanliness norms, factory management, control by foremen, physical work circumstances. None of these speculations were ever tested in non-experimental settings. With respect to cleanliness behavior in a more personal setting (a.o. daily body-washing habits, changing of clothes, use of cosmetics) it was shown, that especially childhood education plays a very important role (Bergler-1974). In view of the importance of the workers' hygienic practices in slaughterlines, more knowledge regarding the determinants of this specific aspect of the workers' jobperformance is strongly needed.

During the last four years a research program was carried out in our departments, which included 1) the *quality of labour* in pig slaughterlines ('humanization') (Gerats et al-1982, not to be reviewed here) and 2) the *hygienic practises of workers* in these slaughterlines. The purpose of the latter investigation was to assess to what factors differences in hygienic practices between workers are to be ascribed. A general social-psychologic theory of 'mental incongruencies' was used to derive hypotheses aiming at the explanation of differences in hygienic practices between workers. This theory allows the explanation of so-called 'mental processes' (motivations, attitudes, cognitions) as well as patterns of actual behavior in given situations (Tazelaar-1980, Tazelaar & Wippler-1981). The results of this investigation are the subject of this article.

2. METHODS

The research was carried out in 6 modern Dutch pig slaughterlines, each having a production capacity of over 100,000 pigs a year. In these slaughterlines over 200 workers were employed, of which a 106 occupied functions considered to be more or less 'risky' in terms of hygiene (f.i. carcass cutters). During slaughtering, these workers were observed to determine the degree of their hygienic jobperformance. In order to prevent distortions, observations were repeated until slaughterprocedures were considered to be performed as a routine. All observations were carried out repeatedly during periods of fifteen minutes uninterrupted worktime. Special attention was paid to 1) the frequency of disinfection of slaughter tools in hot water; 2) the frequency of cleaning of slaughter tools in luke-warm or cold water; 3) frequency of handwashings; 4) accessibility of hygiene provisions at the workspot, including means of knife disinfection ('hot water'), manual showers and handwashing facilities. During working hours, all 106 workers were interviewed by trained interviewers. The questionnaires included questions with regard to a.o. hygienic practices, general and specific motivations or attitudes towards 'hygiene' and 'hygiene-behaviour'; knowledge of bacteriology in general and of the mechanisms of bacterial contamination of carcasses during slaughtering in particular; opinions regarding hygienic practices and motivations of colleagues, foremen and meatinspectors.

3. RESULTS

3.1 Hygienic practises. During a standard observation period of 15 minutes uninterrupted worktime, 16% of the workers disinfects slaughter tools (usually a knife) in hot water (82°C). Workers in the higher 'risk' groups (f.i. carcass cutters,) do not disinfect their knife more regularly than workers in the lower ones. Even after severing intestines, a careful disinfection of knives is not always carried out. Cleaning of slaughter tools by rinsing in luke-warm or cold water is done more regularly: 51% of the workers carries out this kind of hygiene action one or more times during the observation period. Almost none of the workers is used to clean hands with water and soap during worktime. About 51% of the workers rinses hands and arms with cold or luke-warm water, generally simultaneously with knife cleaning.