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TRIPS, SLIPS AND FALLS IN SMES - ANALYSING RISKS IN THE MEAT INDUSTRY

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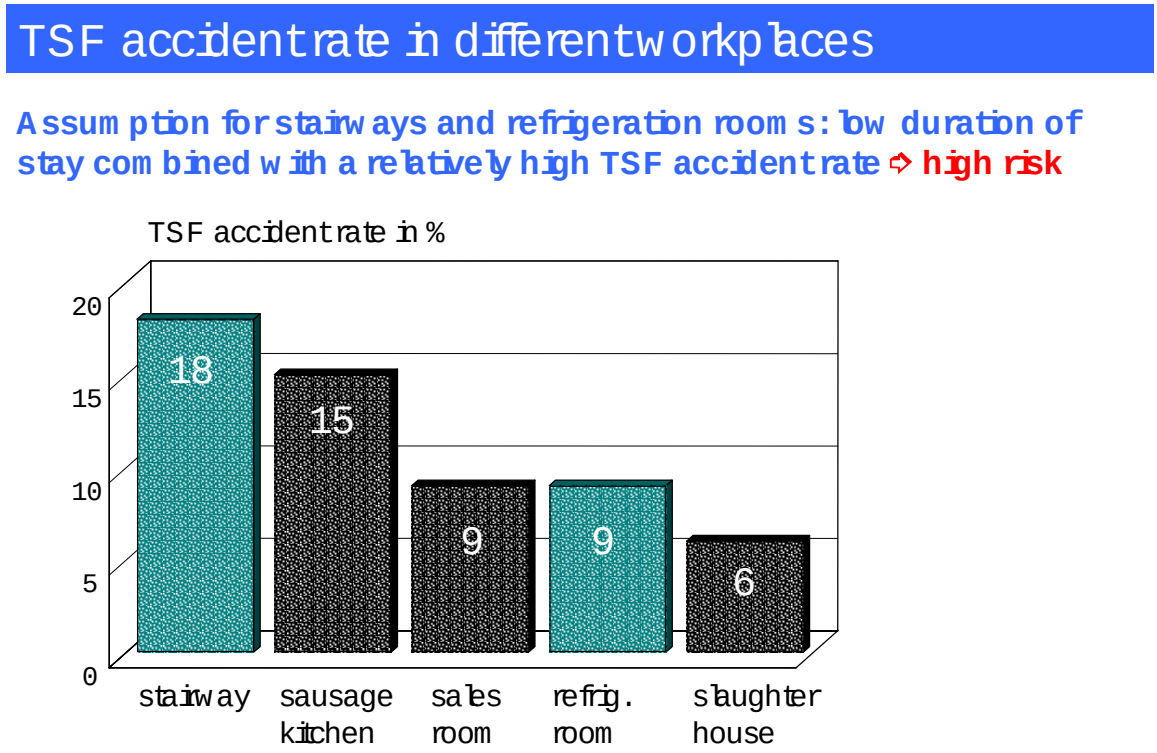
Accidents at work involving trips, slips and falls (TSFs) happen very frequently and the resulting costs are high, both for employers and employees. In certain types of small and medium-sized firms (SMEs), such as those in the meat processing industry, trips, slips and falls account for more accident compensation payments than other accidents.

In the German industry and trade about 225,000 injuries in the workplace per year are caused by trips, slips, and falls and result in absences of over three days (>3-days) from the workplace. These kinds of accidents are usually known as 'TSF accidents'. TSF accidents are responsible for 19 % of all '>3-days' absences from the workplace and 25 % of all annually new accident compensation payments. The risk of getting seriously injured in a TSF accident is 1.4 times higher than for all other types of accidents.

The German meat industry reports that approximately 3,000 TSF accidents per year make up 12 % of all absences of more than three days from the workplace. This is quite a low level for all of the industry, but, given that TSF accidents account for 50 % of all annually new accident compensation payments, it means that in the meat industry there is a higher risk of getting seriously injured from a TSF accident. In fact, you are four times more likely to be seriously injured from a TSF accident than from all other types of accidents.

TSF accident rate in different work areas



The TSF accident rate in different workplaces in the meat industry can easily be analysed by means of regularly recorded accident statistics. The diagram shows that the TSF accident rate on stairways is very high. Taking into account the short time a stairway is used, the relative risk that a TSF accident occurs on stairways is even higher. A similar ratio can be assumed for refrigeration rooms.

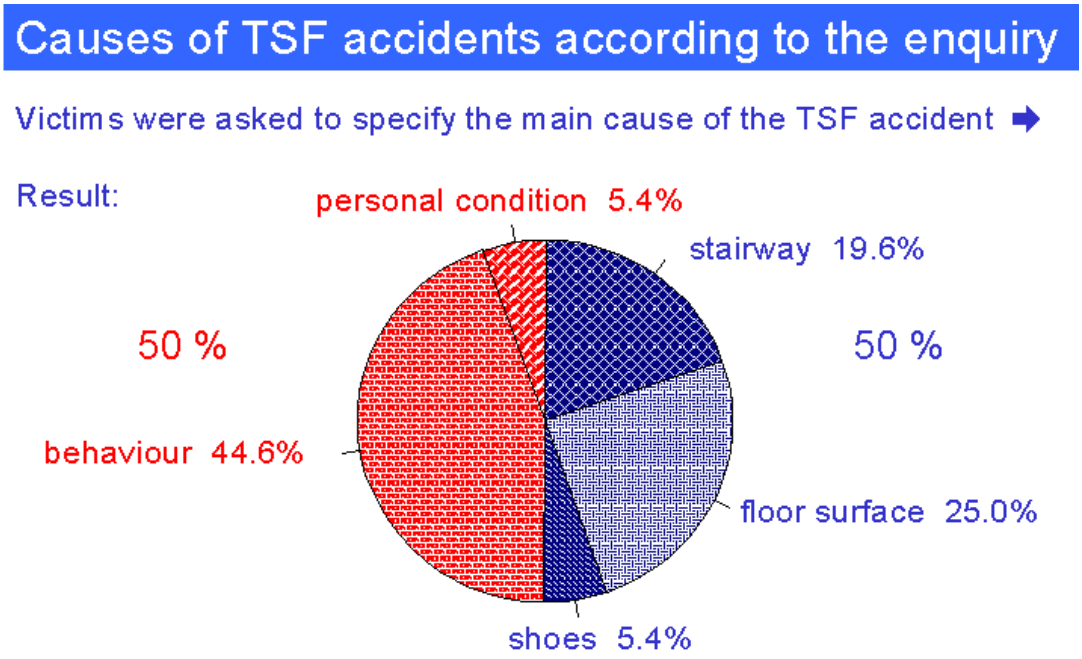
If we are to devise suitable and effective preventive measures, we need to know what causes these accidents. We also need to analyse the risks in relation to the various work areas and the tasks involved.

Co-operative project "Meat industry"

In order to get a better understanding of the risk of having a TSF accident in the German meat industry, the accident insurers (BG, Institution for Statutory Accident Insurance and Prevention) for the German meat industry, and the Institute for Occupational Safety of the BGs (BIA) collaborated in a joint project. This project was divided into three parts. The first part consisted of a study of 95 TSF accidents using a detailed accident questionnaire and standardised criteria [1], checks of stairways and shoes involved in accidents, and slip resistance measurements of floor surfaces.

The second part involved a new method of identifying high-risk workplaces. The third part is an ongoing publicity campaign based on the findings of the project and organised by the Meat Industry BG. Research for the first part consisted of information provided by the TSF accident victims from 95 small and medium-sized enterprises: i.e. causes of TSF accidents, type of shoes worn, the friction level of floors at the accident site and architectural details (eg. stairway measurements, lighting, floor surfaces in refrigeration rooms).

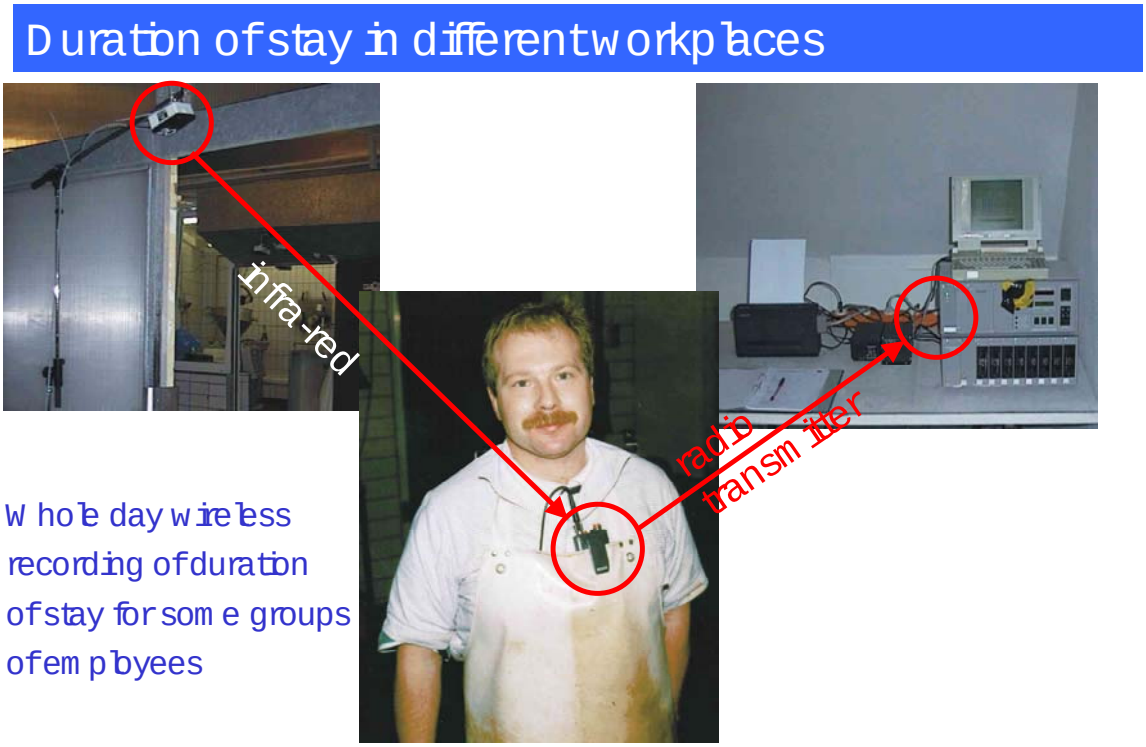
Causes of TSF accidents



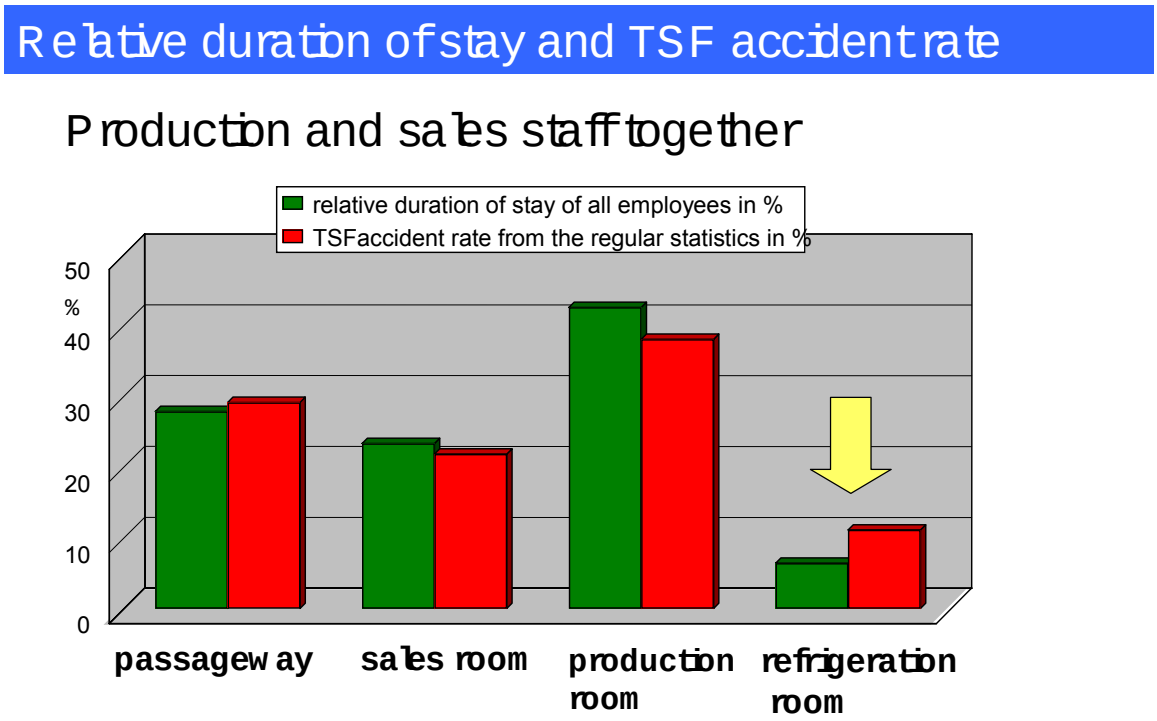
An evaluation of the detailed accident questionnaire indicated that about 50 % of the TSF accidents were caused by technical/structural reasons and the remaining 50 % were due to the behaviour of the victims. The percentage of technical/structural reasons is relatively high. The result could have been influenced by the opinion of the victims. But, an analysis of the accidents showed that more than 53 % of stairways had defects and 80 % were poorly lit. The study of the friction coefficients of the floor surfaces indicated particularly low values in the refrigeration rooms. Similarly, a study of the footwear worn during the accidents showed that these often remained in use long after their recommended life cycle [2].

For the second part of the research a new method was used to analyse the relationship between the length of time an employee spends working in any one area - i.e. the degree of their exposure to different floor surfaces - and the frequency of accidents. We will now look at how we recorded a person's movement or their length of stay in any one work area:

Duration of stay in different work areas



A sequence of staff movements (of several personnel) was automatically recorded over a period of one week in five small and medium-sized companies. The equipment used to measure, record and analyse this was based on a personnel emergency warning device, which sends a radio signal to a central recording station giving the whereabouts of each member of staff.

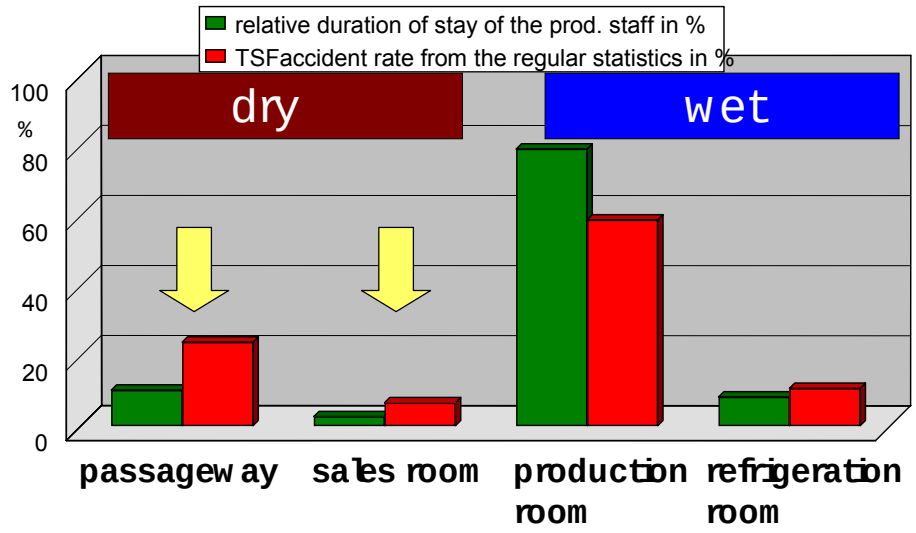


The diagram shows the relationship between the length of time an employee spends working in different work areas compared with the accident rate. It confirms the above assumption that in addition to stairways, refrigeration rooms are also work areas where staff run a high risk of getting injured from a TSF accident. The workplace "passageway" includes stairways and shows no extreme TSF accident risk for any employee.

For the purposes of this study, sausage kitchens and slaughter houses were put together under the heading "production rooms". Production rooms had a lower TSF accident risk than refrigeration rooms, passageways and sales rooms.

Relative duration of stay and TSF accident rate

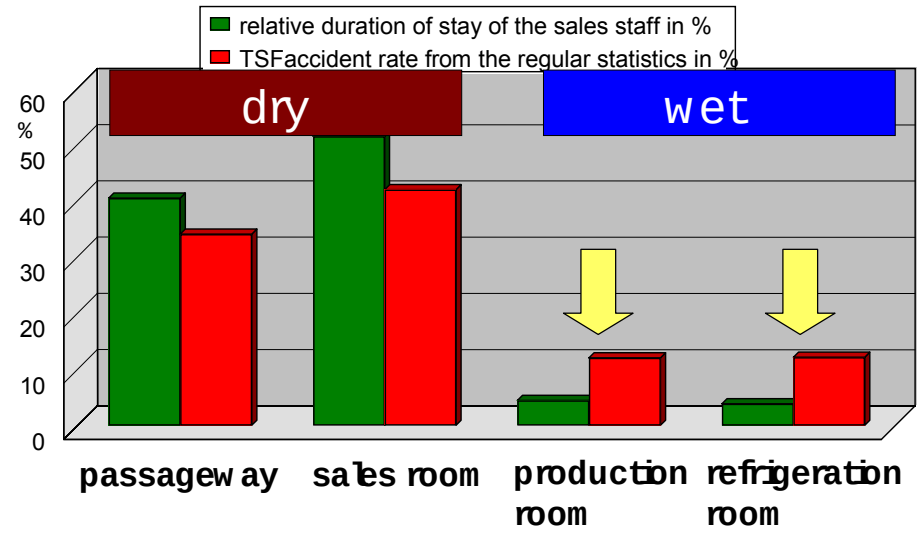
Production staff only



The comparison between the length of time spent in a work area and the accident rate for production personnel showed that they were at higher relative risk in passageways and in the sales areas.

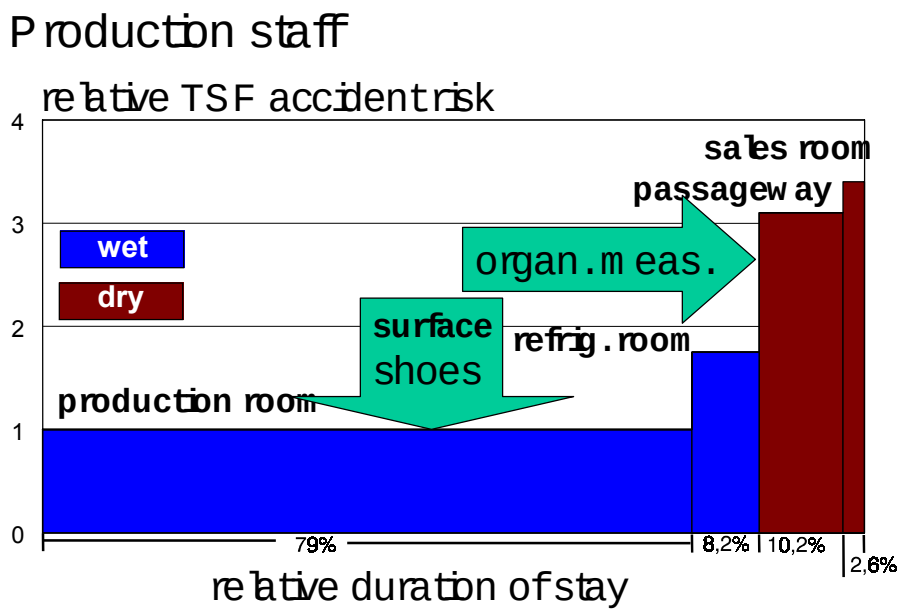
Relative duration of stay and TSF accident rate

Sales staff only



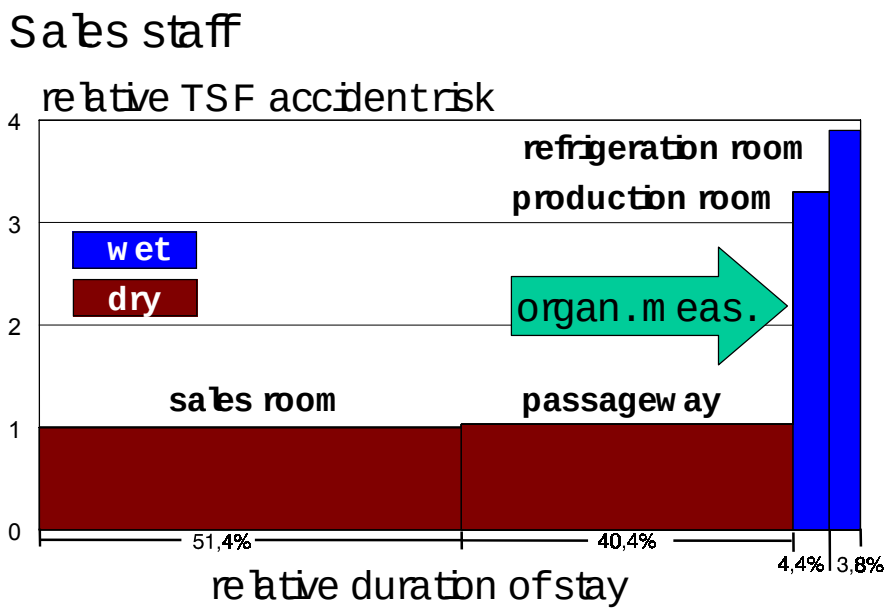
The comparison between length of time spent by an employee in one area with the accident figures shows that for sales staff there is a higher risk of an accident occurring in production areas and in refrigeration rooms. The new method was then used to assess the relative risks of the different work areas for sales and production personnel, who each wear very different types of footwear.

Relative duration of stay and rel. TSF accident risk



The relative TSF accident risk was calculated when the specific TSF accident rate at a particular location was divided by the amount of time spent at that location. The TSF accident risk rate for staff at their usual working location was set at 1.0. For the production staff this risk rate became at least three times higher on passageways including stairways and in sales rooms compared to their usual working environment.

Relative duration of stay and rel. TSF accident risk



The sales staff spends 92 % of their working time in work areas with dry surfaces. If they leave this area, the risk rate can be more than 3, and up to 4 times higher in production and refrigeration rooms. The above analysis shows that the accident risk increases once the employee leaves their usual work area.

Structural and organisational measures are necessary to avoid staff moving between different workplaces with different flooring, particularly between dry and wet areas.

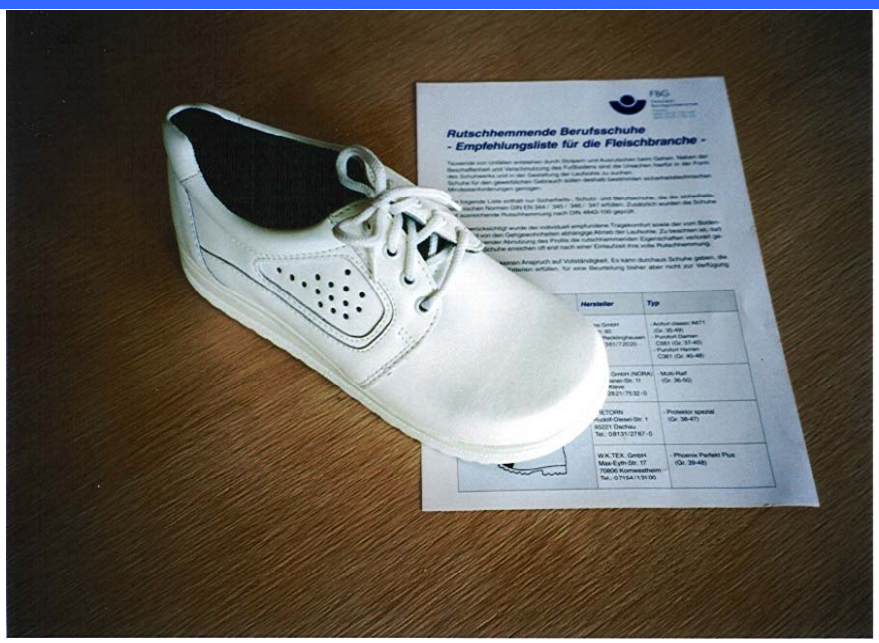
Workers' main motive for leaving their usual work area is for transportation purposes. An individual solution for each of the transportation problems would be a big advantage. The best solution is to have

automated transportation eg. a lift between two or more floors. But this would be too expensive for small enterprises. On the other hand, a cheap measure must not be a bad one. The simplest solution for transporting goods on the same floor is that one person pushes a trolley though his own work area and then hands it over to another employee for doors or passageways. If this is a well-organised procedure then nobody has to leave their work area to enter high risk workplaces. But as refrigeration rooms are not permanent workplaces, a general problem remains. In this case structural measure could be applied, eg. improving the slip resistance of the floor surface. Consequently, a campaign for reducing TSF accidents should cover both technical and organisational measures. This was observed in the publicity campaign organised by the Meat Industry BG.

Recommended shoes for the meat industry

A list of recommended footwear suitable for **all** meat industry workplaces has been produced. There are better shoes for specific work areas, but those shoes could be unsuitable for other work areas. The recommended footwear is a good compromise to wear for all relevant meat industry workplaces.

List of recommended shoes for the meat industry



provided by K. Selge, Meat Industry BG, Germany

The objective of this publicity campaign was to raise public awareness of unsolved problems. The aim was to influence people's behaviour in the workplace.

Advertisement and Poster of the publicity campaign

provided by K. Selge, Meat Industry BG, Germany

The publicity campaign was started by the Meat Industry BG to make SMEs aware of the problems and to suggest solutions. The publicity campaign is ongoing and will be continued by a new campaign of all BGs next year.

Prevention of TSF accidents

The following preventive measures are suggested:

Structural and technical measures

- Design new facilities so as to avoid stairways and stairway landings.
- Ensure that stairways are standard and well lit.
- Check that floor surfaces have been properly laid, using a device for measuring its anti-slip properties, especially during construction or renovation work.

Organisational and behavioural measures

- Footwear should be suitable for the type and condition of flooring. A list of recommended footwear is available. The transportation of goods should be well organised.
- Reduce the frequency of staff movements between work areas with different types of flooring, and especially between wet and dry areas. This could be done either by reorganising the work, or by renovating a particular area.
- Discourage staff from rushing up and down stairways.

Sources:

[1] Schenk, H., Kaulbars, U., Meierdiercks R.C.: Stolper-, Rutsch- und Sturzunfälle in Klein- und Mittelbetrieben der Fleischwirtschaft - Präventionsmaßnahmen, Messverfahren, Ursachenanalyse. BIA-Report 2/2000. Hrsg.: Hauptverband der gewerblichen Berufsgenossenschaften (HVBG, Sankt Augustin (2000)

[2] Schenk, H., Selge, K.: Prävention von Stolper-, Rutsch- und Sturzunfällen in Betrieben der Fleischwirtschaft, Die BG, Heft 6/99, Erich Schmidt Verlag, Bielefeld