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Target Audience

Inspectors responsible for the food and drink industries
Specialist Group Inspectors (Occ Hyg, Medical and Occ Health)

IMPORTANCE OF GOOD VENTILATION IN COMMERCIAL KITCHENS AND INDUSTRIAL COOKING AREAS

This SIM provides information on the findings of HSE research to determine any health risk there may be from exposure to cooking fumes evolved from directly heating meat, fish, cooking oils etc in catering kitchens and food factories. Current indications are that there is no measurable health risk so long as adequate extraction ventilation is provided.

BACKGROUND

1 NIGM 5B/1998/11 discussed the possibility of health risks to catering kitchen staff exposed to cooking fumes following HSE toxicological research which indicated that cooking fumes contained potential carcinogenic substances evolved from directly heating meats, fish, cooking oils etc.

2 An HSE review carried out in 1998 on levels of ill health concluded that the limited available epidemiological evidence suggested no increased risk of cancer (in particular lung cancer) from cooking fumes among staff in catering kitchens in the UK compared with the population as a whole.

3 The NIGM indicated that further research (involving on-site cooking fume analysis and personal exposure) would be carried out by HSE to better understand any risks to health and that this research would include risks from deep frying in food factories.

4 A Press Release was issued in March 1998 (copy attached to NIGM 5B/1998/11) outlining information then available and indicating further research would be carried out.

FINDINGS OF LATEST RESEARCH

5 Research carried out by HSE since 1998 has measured on-site exposure of workers to any potentially harmful fumes especially from cooking meat and fish or from heated cooking oils. The research was carried out at 6 food factory and 6 catering establishments where workers were daily exposed to cooking fumes.

6 The study showed that the levels of fumes in all 12 establishments (which had typical fume extraction systems) appeared to be under adequate control. The majority of the specified target compounds were below the limit of detection and no significant exposure was found to the majority of the components of cooking fume assigned occupational

exposure limits (OELs).

7 Exposure to many airborne chemicals was measured, including heterocyclic amines, nitrosamines, polycyclic aromatic hydrocarbons (PAH), aldehydes and various volatile organic substances. Irritants such as acrolein, formaldehyde and acetaldehyde were detected, but all at levels below their particular OELs. Total inhalable particulates (TIPs) were also below the airborne limit which brings any particulate within the scope of the Control of Substances Hazardous to Health Regulations (COSHH). One location marginally exceeded the airborne limit and in this case, general ventilation was poor.


8 Many other substances were measured but not detected, eg N-nitrosamines, many of which are known potent cancer causing agents. Some low exposure to substances which are defined as carcinogens under COSHH, such as PAH, was measured. However the levels were very low compared with occupational exposures in other industries.

CONCLUSIONS

9 Taking the latest research findings and the earlier epidemiological findings ([para 2](#)) together, it can reasonably be concluded, that we do not currently know of any work-related risk of lung cancer among food industry and commercial kitchen workers. However, the epidemiological review was constrained by a number of factors associated with the research papers studied. In view of the limited evidence, negative findings could not be considered as conclusive proof of no risk to UK cooks, although if any work related risk were to exist it was considered it would be likely to be small (with the current state of knowledge).

10 The results should offer reassurance to employers and employees that current controls are adequate. However, available information is still limited and it is not possible to state conclusively that no risk exists. It is therefore important that fume extraction systems to current standards are provided and maintained. Should future evidence emerge indicating that a risk exists, current controls will be reviewed.

GUIDANCE

11 HSE Catering Information Sheet 10 [Ventilation of kitchens in catering establishments](#)  gives guidance for catering kitchens. Extraction ventilation for cooking fumes in food factories needs to be assessed on a site-by-site basis and will depend on the particular processes involved.

12 The HSE Press Release issued February 2001 is reproduced at the [appendix](#).

ACTION REQUIRED

13 No specific visits are required. However inspectors will wish to be aware of the information in this SIM and ensure that adequate extraction ventilation is provided at relevant cooking processes.

Date first issued: 10 May 2001

APPENDIX (para12)

HSE Press Release E021:01 - 13 February 2001

HSE stresses the importance of good ventilation in commercial kitchens and industrial cooking areas

Recent research by the Health and Safety Executive (HSE) on exposure of kitchen and factory workers to cooking fumes reinforces the importance of providing and maintaining good ventilation in catering kitchens and industrial cooking areas, particularly where meat, fish and cooking oils are directly heated.

A previous review by HSE identified that fumes generated from directly heating foods during frying, grilling and stir frying contained small quantities of carcinogens and therefore warranted further research.

The new research measured exposure of workers to any potentially harmful fumes especially from cooking meat and fish or from heated cooking oils. It was carried out at 6 food factory and 6 catering establishments where workers were daily exposed to cooking fumes.

The study showed that the levels of fumes in all 12 establishments (which had typical fume extraction systems) appeared to be under adequate control. The majority of the specified target compounds were below the limit of detection and no significant exposure was found to the majority of the components of cooking fume assigned occupational exposure limits (OELs).

The study did not include domestic cooking where any exposure will be significantly less. Exposure to many airborne chemicals was measured, including heterocyclic amines, nitrosamines, polycyclic aromatic hydrocarbons (PAH), aldehydes and various volatile organic substances

Irritants such as acrolein, formaldehyde and acetaldehyde were detected, but all at levels below their particular OELs. Total inhalable particulates (TIPs) were also below the airborne limit which brings any particulate within the scope of the Control of Substances Hazardous to Health (COSHH) Regulations. One location marginally exceeded the airborne limit and in this case, general ventilation was poor.

Percy Smith of HSE's Food & Entertainment Sector said:

"HSE has discussed the findings of the research with both employer and employee representatives in the food and catering industries. Our research on exposure of kitchen and factory workers to cooking fumes reinforces the importance of providing and maintaining good ventilation in catering kitchens and industrial cooking areas."

Many other substances were measured but not detected - such as N-nitrosamines, many of which are known potent cancer causing agents. Some low exposure to substances which are defined as carcinogens under COSHH, such as PAH, was measured. However the levels were very low compared with occupational exposures in other industries.

An earlier HSE review on levels of ill health in 1998 concluded that the limited available epidemiological evidence suggested no increased risk of cancer from cooking fumes (in particular lung cancer) among staff in catering kitchens in the UK compared with the population as a whole. Taking these studies together, it can reasonably be concluded, that we do not currently know of any work related risk of lung cancer among these workers.

The results offer reassurance to employers and employees that current controls are adequate. However, available information is still limited and it is not possible to state conclusively that no risk exists. It is therefore important that fume extraction systems to current standards are provided and maintained. Should future evidence emerge indicating that a risk exists, current controls will be reviewed.

NOTES TO EDITORS:

1. This risk of exposure to cooking fumes was considered for workers in food factories and cooks in catering establishments directly exposed to the cooking process for long periods of the day; it does not apply to people in domestic situations where cooking is an occasional activity.
2. A fundamental requirement of the Control of Substances Hazardous to Health (COSHH) Regulations is that employers should prevent the exposure of their employees to hazardous substances or, where that is not reasonably practicable, ensure that there is adequate control of hazardous substances.
3. Although some constituents of cooking fumes have an OEL, no specific OEL has been assigned to cooking fumes. Where no exposure limits are assigned, employers are required to control exposure to a level which nearly all those working could be exposed day after day at work without adverse effects on health. The information sheet 'Ventilation of kitchens in catering establishments' provides guidance on how employers can meet their obligations under COSHH with respect to cooking fumes.
4. The HSE review of cooking fumes carried out in 1998 was an epidemiological review and was constrained by a number of factors associated with the research papers studied. In view of the limited evidence, negative findings could not be considered as conclusive proof of no risk to UK cooks, although if any work related risk were to exist it was considered it would be likely to be small (with the current state of knowledge).
5. In a separate but related study carried out for HSE, airborne N-nitrosamines were also measured at fish (kipper) smoking in two traditional smoke houses using manually lit fires. N-nitrosamines were not detected at either site.

Copies of the information sheet '*Ventilation of kitchens in catering establishments*' (*HSECatering Sheet No. 10*) can be ordered online at: www.hsebooks.co.uk or are available from HSE Books, PO Box 1999, Sudbury, Suffolk, CO10 2WA, tel: 01787-881165 or fax: 01787-313995).

