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## ADVISORY COMMITTEE ON TOXIC SUBSTANCES

### Report on the work of the ACTS Flour Dust Working Group

#### A Paper by Frances Rowswell

Cleared by Andie Michael on 15 November 2006

#### Issue

1. Report to ACTS members on the activities of the sub-group on flour dust.

#### Timing

2. Routine.

#### Recommendation

3. That ACTS notes the activities of the working group and on-going work on flour dust as part of HSE's Disease Reduction Programme, and agrees to extend the life of the group and to review this once the future of ACTS has been agreed.

#### Background

4. Flour dust is one of the top causes of occupational asthma with an incidence rate of 78/100 000. In March 2004, ACTS agreed to the setting up of a small working group with industry, trade union and local authority representation to focus on developing a strategy for improving compliance with what was then the Maximum Exposure Limit ( $10\text{mg.m}^{-3}$  8 hour time weighted average;  $30\text{ mg.m}^{-3}$  short-term exposure limit, 15 minute reference period). ACTS had requested a review three years after implementation of the MEL in May 2001 and was concerned at the lack of enforcement and compliance with the MEL. The MEL became a Workplace Exposure Limit (WEL) in April 2005 when the new Occupational Exposure Limits framework came into force. The flour dust working group was expected to have a life of about two years. ACTS was

kept informed of its work in June 2005 (ACTS/25/2005) and May 2006 (ACTS/07/2006).

5. The working group met for the first time in November 2004 and a draft action plan was produced. The action plan focused on working with partners to improve control of flour dust and enzymes used in flour improvers, to achieve improvements in good practice and, specifically, compliance with the WEL. The working group met for the second time in September 2005 to review progress against the action plan and consider HSE's proposals for a two-year national initiative on flour dust that commenced in April 2006. The working group met for the third time in September 2006 to discuss recent activity on flour dust and consider priorities for future work.

### **Argument**

6. The flour dust WEL is significantly higher than the limits in other EU countries and the EC's Scientific Committee on Occupational Exposure Limits is recommending a health-based limit between 0.5 and 1 mg/m<sup>-3</sup>. Flour dust exposures do not appear to have decreased since the introduction of the WEL in 2001. A recent report by the Institute of Occupational Medicine for HSE entitled 'Trends in inhalation exposure mid 1980s till present' found that 'downward trends in exposure were observed for all the substances analysed except for flour dust'. Research by HSL (executive summary of MU/05/10 'Respiratory symptoms in bakers' attached at Annex 1) found flour or enzyme sensitisation in 1 in 7 bakers, and work-related respiratory symptoms in many more. HSE's view is that reducing most exposures to below one third of the WEL could indicate compliance with COSHH and some HSE specialists view 2 mg/m<sup>-3</sup> as a value that should be met through good control practice.
7. A national initiative on flour dust commenced in April 2006 as part of HSE's Respiratory Disease Project within the Disease Reduction Programme.

During 2006/7:

- (i) HSE inspectors will be visiting a proportion of plant and medium-sized bakeries to evaluate flour dust control systems and the provision of health surveillance.
- (ii) Following a successful one-day training event on flour dust for local authority environmental health officers, delivered by HSL and HSE in North Wales in January 2006, ten further DRP one-day training events that included a session on flour dust were attended by nearly 900 EHOs across Great Britain.
- (iii) The training is being followed by an inspection intervention, with Local Authority inspectors being asked to carry out inspections in LA-enforced bakeries and other food preparation and manufacturing premises where flour is used.

(iii) HSE met with representatives from the major supermarkets, LACoRS, trade union and other partners and agreed to develop benchmark standards for the control of flour dust in in-store bakeries. Once agreed, this document will be made available to EHOs via the extranet.

8. At its meeting in September, the flour dust working group agreed that flour dust remains a key issue and identified a number of areas for future activity. These included evaluating the effectiveness of the work so far, building best practice into industry training courses, the provision of a positive message about dust control on bags of flour, and further work with the Association of Bakery Ingredient Manufacturers on reducing the dustiness of enzyme containing flour improvers. The flour dust COSHH essentials sheets have been re-drafted and these have been sent to working group members for comment. An on-line community of interest has recently been set up to act as a discussion forum on flour dust and both working group members and ACTS members will shortly receive an invitation to join the group.
9. Since June 2006, vacuum cleaners used in bakeries may need to comply with the Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 1996 that implement the EC ATEX Directive. ATEX compliant vacuum cleaners cost in the region of £2,000, a major expense for a small bakery. Draft guidance on the selection and use of vacuum cleaners for cleaning up flour has been produced by HSL, and HSE is currently considering how best to take this forward.

#### **Link to HSC Strategy**

10. The working group's activities are consistent with HSC's strategy for the health and safety system in Great Britain. The overall aim of the work on occupational asthma is to meet the target of a 30% reduction by 2010. The Fit 3 (Fit for work, fit for life, fit for tomorrow) strategic programme plan sets an intermediate target of a 10% reduction by 2008 against the 2004/5 baseline.

#### **Communication Plan**

11. Communications have been a priority issue for the working group. Members have been instrumental in cascading key messages on flour dust control to industry. A planned communications initiative will target ethnic bakeries with key messages on flour dust.

#### **Evaluation Plan**

12. HSE is currently developing a research proposal to evaluate the impact of its activity on flour dust so far in raising awareness and effecting behaviour change amongst those exposed to flour dust. This work will be carried out by HSL and the ACTS Flour Dust Working Group will be consulted.

**Consultation**

13. The working group members will continue to consult within their own organisations and more widely with other partners as the work progresses.

**Costs and Benefits**

14. There are clear benefits of ACTS working with industry and other partners to improve good practice and compliance.

**Financial/Resource Implications for HSE**

15. Running costs of the group are being met from existing resources.

**Environmental implications**

16. None

**European implications**

17. Not applicable.

**Other implications**

18. None.

**Action**

19. ACTS members are asked to note the information provided on progress with the work on flour dust, to agree to the retention of the ACTS working group and for its future to be reviewed again once the future of ACTS has been decided.

**Contact**

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## Respiratory symptoms in bakers (HSL report MU/05/10)

### EXECUTIVE SUMMARY

#### Introduction

Flour dust is an asthmagen. It is known to cause sensitisation, allergic rhinitis and occupational asthma among exposed individuals working in the baking industry. Flour dust can also act as an irritant and may give rise to short-term respiratory nasal and eye symptoms, or it may provoke an asthma attack in individuals with pre-existing disease. In the longer term, flour dust exposure may lead to a chronic obstructive pulmonary disorder in susceptible individuals. There has been a recent focus on exogenous enzymes, which are added to flour ("improvers") to improve dough quality and shelf life. These are now known to cause sensitisation and symptoms in susceptible individuals.

#### Background

Fifty-five bakeries in England, Scotland and Wales (Health and Safety Executive and Local Authority inspected) were originally visited by regional HSE and LA inspectors to assess the baseline of current control measures and levels of exposure to flour dust. Twenty-two of the thirty-eight bakeries in England and Wales agreed to participate in a secondary study investigating the prevalence of work-related symptoms and sensitisation in bakers. The original survey, demonstrated that as a group, the mixers, weighers and sievers were exposed to the highest median flour dust levels at 5.2 mg/m<sup>3</sup>, followed by cleaners at 4.4 mg/m<sup>3</sup>, general bakers at 3.6 mg/m<sup>3</sup> and other at 2.1 mg/m<sup>3</sup>. Therefore, for the purposes of this study the job titles were ranked by increasing median dust levels and aggregated into three exposure categories. Mixers, weighers, sievers and cleaners were categorised as high exposure, general bakers as medium exposure and others as low exposure.

#### Objectives

The objectives of the study were to investigate the relationship between respiratory symptoms in bakers, sensitisation to wheat flour and a range of enzymes, and current flour dust exposure categories.

#### Main Findings

- 225 bakers participated in the study
- This study demonstrated that **43% of bakers reported at least one work-related respiratory symptom.**
- There was **no significant difference in prevalence of symptoms in bakers classified by bakery size**, which would suggest that **any package of measures aiming to reduce the incidence of work-related symptoms in bakers, would need to have an equivalent degree of control for all bakeries, irrespective of size.**
- Sensitisation to workplace allergens was relatively common, with **14% of workers exhibiting specific IgE to either wheat flour or enzymes.**
- **Work-related respiratory symptoms** were shown (by univariate analysis) to be **significantly associated with exposure categories to flour dust and sensitisation to the combination of wheat and enzyme.**

- Regression analysis (adjusted for age, smoking status, time spent in industry and atopic status) of lower respiratory symptoms, identified a significant **association between work-related chest tightness and sensitisation to wheat and enzyme.**
- Univariate analysis demonstrated no association between abnormal lung function and upper respiratory symptoms, but a significant **association (abnormal mid expiratory flows [MEF]) in those individuals with lower respiratory symptoms only.** MEF may be used by clinicians as a relatively early marker of small airways disease and is consistent with an early physiological abnormality in workers exposed to allergen.
- Regression analysis (adjusted for age, exposure category, smoking status and time spent in industry) identified an association between atopy and workplace allergen sensitisation.
- **The provision of some form of training on flour dust for employees joining the company appeared to have no effect on the numbers of individuals reporting symptoms.** However, we have no information about the levels of knowledge transfer within the bakeries visited, or the content or delivery of the training materials used in the bakeries. The delivery of training alone may not be sufficient to improve working practices if the organisational culture is not supportive of health and safety.
- Workers at bakeries with inadequate control measures (deemed unlikely to comply with the WEL for flour dust) were no more likely to report work-related symptoms than those working at establishments deemed adequate. We have no way of knowing whether the inspection by the HSE or the wearing of sampler pumps altered worker behaviour. Furthermore, we do not know what a 'safe' level of exposure to flour dust would be. Emerging evidence suggests that exposure below the WELs may cause respiratory symptoms.

## Conclusion

This study highlighted the main associations of exposure category, sensitisation to work place allergens (a combination of wheat and enzyme) and atopy with work-related symptoms. These findings were consistent with previous historic data, and introduce new information on enzymes. These associations have implications for any health surveillance programmes within the baking industry, as it may highlight those groups of individuals with a higher risk of developing work-related symptoms. This work also suggested that there is similar risk of developing symptoms whether an individual works in a small or large bakery, stressing the importance of implementing health surveillance in small to medium sized bakeries as well as the larger more industrialised bakeries.