SLIDE 1 – RHM Squares
- Jon Fitt - Senior Safety and Hygiene Adviser working for RHMS.
- Safety & Hygiene Advisers, Occupational Nurses & Doctors
- In house occupational health and safety service for RHM.

SLIDE 2 – Front Page
- Preventing Baker’s Asthma in RHM.

SLIDE 3 - Contents
- Background to the company and who we are.
- Dust exposure in our business
- Our dust monitoring programme
- Our control strategy to prevent Bakers asthma in RHM
- How effective this strategy has been.

SLIDE 4 – RHM Bread Bakeries
- RHM is one of the largest food companies in the UK and Ireland
- Over 20000 employees and 69 manufacturing sites in the UK and Europe
- At least one of our branded products on your shelves at home.
- **RHM is organised in to 3 divisions:**
  - **Bread Bakeries**
    - Flour milling and manufacture of wrapped and part baked bread
      - Hovis
      - Mothers Pride
      - Hovis & McDougall’s Flour
    - Biggest division with
      - 15 bread bakeries
      - 11 flour mills
      - 6 factories, which manufacture frozen part, baked bread.

SLIDE 5 – RHM Culinary Brands
- **Consumer Brands**
  - Grocery brand division
    - Sharwoods
    - Robertson’s Jams
    - Bisto
    - Paxo

SLIDE 6 – RHM Cakes & Customer Partnerships
- **Cakes & Customer Partnerships**
- Ready made meals, cakes
  - Mr Kipling
  - Cadbury Cakes
- Long-term partners such as M & S, Pizza Hut
- Majority of our businesses manufacture products where contact with grain, flour and other ingredients are inevitable and where exposure to these dusts is an everyday occurrence.

Better foods for a better life
SLIDE 7 - Ramazzini
- Bakers Asthma was first recognised around 1700
- Italian physician called Ramazzini published a work called “De Morbis Artificium”.
- He studied a number of occupational conditions amongst which he recognised respiratory problems in millers and bakers.
- Although knowledge of causation at that time was fairly scant, he considered that the problem could have been caused by **stickiness of flour from the inhaled dust entering the person’s air passages**.

SLIDE 8 - Symptoms
- Since then a large body of research has accumulated which can be basically summarised into a simple statement “that bakery dust can produce 2 symptoms - **asthma and rhinitis**.”
- Very simply rhinitis is an irritation of the nose resulting in a runny nose.
- Asthma is where the person becomes sensitised resulting in attacks of breathlessness, tightness in the chest and wheezing. Once a person is allergic to flour dust, exposure to even a small quantity can bring on an asthmatic effect.

SLIDE 9 - Dusts
- Other Ingredients such as fungal amylase present in flour treatment improvers can also cause allergic reactions.

SLIDE 10 – Exposure Limits
- So how much dust causes problems?
- UK exposure standards are framed in units of measurement of milligrams per cubic metre of air (mgm⁻³) based on total inhalable dust (rather than specific constituents of dust).
- There is a Maximum Exposure Limit set for flour of 10 mgm⁻³ (averaged over a 8 hour period) and also a short-term exposure limit of 30 mgm-³ (averaged over a 15 minute period).
- 10 mgm⁻³ is equivalent to 10 teaspoons of flour over a football field.
- Within RHM we have also set an in-house standard of 1 mgm⁻³ for amylase found in bread improvers. To comply with the MEL we must ensure that employees exposure is below the limit but also as far as is reasonably practicable below the limit.
- NB. Total inhalable dust is the amount of airborne dust that enters the nose and mouth during breathing and is therefore available for deposition on the respiratory tract
- Total respirable dust is dust that is breathed deep into the lungs

SLIDE 11/12 – Monitoring Exposure
- A programme for monitoring exposure of ingredient dust to exposed personnel, based on personal sampling, has been in place across RHM sites since 1988. **Methodology is HSE MDHS 14/3.**
- Initially the sampling concentrated on flour dust, but subsequently other ingredients such as bread improvers were included.
- As a result of the sampling programme, RHM now holds a large database of information covering the results of both personal and background samples. It is therefore possible to characterise typical exposures for all of the jobs, which are routinely performed at the sites.
SLIDE 13 – Dust Lamp
- Of course there are a few simple tools you can use to determine if you have a dust problem likely to cause problems to your employees.
- One is simply to wipe clean a horizontal surface and revisit it until it is possible to write (with the finger) an “X” that is easily discernible (from a distance of one metre) on the surface.
- Another useful tool is the dust lamp, which we use in all dust surveys. The dust lamp sometimes called a Tyndall beam will illuminate dust particles not normally seen by the human eye. This can be useful when determining if local exhaust ventilation is working properly.

SLIDE 14 – Dust Surveys & Reviews
- Over the years RHM has identified the common tasks, which give rise to significant ingredient dust exposure and can quantify such exposures.
- Therefore repeated routine dust surveys at sites where the process and controls remain unchanged are not carried out.
- Surveys have been completed for all tasks at each site but follow up surveys are only carried out following the installation of local exhaust ventilation (LEV) or other control measures, or if other changes of exposure have been identified.
- Efforts are focussed instead on looking at whether there has been any changes to:
  - the process or conditions,
  - the effectiveness of current control measures
  - includes an examination of the effectiveness of LEV,
  - work methods,
  - suitability and correct use of respiratory protective equipment (RPE)
  - employee training.
- This was a 5 yearly review but changed to an annual review following the introduction of a Maximum Exposure Limit (MEL) for flour dust, in early 2001.

SLIDE 15 – Actual Exposures
- Our large database of information allows us to compare actual exposures that arise in the bakery environment with the limits set by the HSE.
- The next table (Table 1) shows a summary of a large number of measurements performed in RHM Bakeries without any control measures in place.
- All of these were on bread plants, rather than morning goods, and are expressed as 8-hour time weighted averages.
- The four jobs chosen are sieving, weighing, mixing and cleaning.
- The figures exceeding the statutory Maximum Exposure Limit are highlighted.
- For both sieving and weighing operations, even the mean exposure lies above the MEL of 10 mg.m⁻³.
- Furthermore, for all of the jobs, the maximum exposures are well in excess of the MEL, essentially because each of these jobs has a wide variation in the range of exposure.
Table 1 – Exposures (mg.m⁻³) Without Local Exhaust Ventilation

<table>
<thead>
<tr>
<th>Job</th>
<th>Mean</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sieving</td>
<td>15.8</td>
<td>5.8 – 28.5</td>
</tr>
<tr>
<td>Weighing</td>
<td>17.8</td>
<td>4.2 – 45.7</td>
</tr>
<tr>
<td>Mixing</td>
<td>4.5</td>
<td>0.3 – 21.7</td>
</tr>
<tr>
<td>Cleaning</td>
<td>7.0</td>
<td>1.2 – 24.9</td>
</tr>
</tbody>
</table>

SLIDE 16 – RHM Control Measures - Aims
- Essentially, the aims of control were in two parts.
  - Firstly bread improver exposures would be limited to 1 mg.m⁻³ as an eight hour time weighted average.
  - Secondly all other ingredient dusts, including flour, would be limited to 10 mg.m⁻³ as an 8 hour time weighted average.
- Our cases are principally due to sensitisation to fungal amylase contained in bread improvers, therefore the company started to implement specific control measures aimed at limiting sensitisation to fungal amylase i.e. 1 mg.m⁻³

SLIDE 17 – RHM Control Measures - Application
- The strategy for application of control measures has 4 elements:
  - Eliminating Exposure
  - Installation of LEV
  - Improved working practices
  - Mandatory wearing of dust masks

SLIDE 18 – Eliminating Exposure
- Elimination of exposure has been achieved by:
  - Reformulated of bread improvers from powdered ingredient to a liquid or paste. In the long term the movement to liquid improvers could be instrumental in preventing sensitisation. However, at present, liquid improver is not suitable for all recipes.
  - Improved Powdered Ingredients Transfer Methods such as enclosed systems, vacuum systems and remote tipping.

SLIDE 19/20/21 – Local Exhaust Ventilation (LEV)
- The provision of local exhaust ventilation systems (LEV) is central to RHM’s strategy for control of dust exposure.
- To date, large amounts of capital have been invested in providing systems at flour and ingredient weigh and dispense stations.
- Since 1999 British Bakeries alone have invested circa £200K in LEV systems with additional ongoing maintenance, servicing and testing costing in excess of £90K / year.
- The walk in booths or laminar flow booths are of a high specification and are similar to that used in the pharmaceutical industry
In recent years, the results of RHMS audits indicated the failure of many sites to maintain these systems, including:

- Varied and often poor quality of contractor LEV test reports, with many falling well short of the legal requirements
- A tendency for sites to miss annual tests either due to poor scheduling or as a result of decisions in times of cost cutting
- Lack of actions or follow-up on under performing systems.

Since the need for dust extraction equipment to be kept in an efficient working order and repair is critical to our strategy for control of dust exposure and indeed to meet the requirements of the COSHH regulations, since January 2003, RHMS has commenced an LEV Management Programme providing routine in-house testing of all flour and grain LEV to operating companies. All the advisers in RHMS have been trained and are competent to carry out this testing. The testing programme, whilst offering potential group wide savings in excess of £32K / annum, has the additional benefit of further reducing the dust exposure risks within the Group.

SLIDE 22/23 – Improved Practices
- There has also been an emphasis on improved working practice.
- Personal monitoring has indicated variation in exposure from person to person often as a result of poor working practice.
- This has involved the provision of information (e.g. leaflets) and direct training including the use of the training video ‘Breathe Easy’ from the FOB.
- Despite this we still find that employees still don’t follow work practices. RHM are currently embarking on a Behavioural Safety Programme which is underpinned by the premise that the vast majority of unsafe behaviours occur for a reason and that by increasing and improving communication about safety in a ‘blame last’ environment, an accurate understanding of the reasons for these unsafe behaviours can be determined. Critical safe behaviours to keep dust to a minimum such use of a vacuum instead of a brush can be incorporated where required into this process.

SLIDE 24/25 – Dust Masks
- The last line of defence has been a mandatory requirement for the wearing of respiratory protection when bread improvers are being handled.
- This measure has been mandated even when local exhaust ventilation is in place to ensure we are reducing exposure levels as low as is reasonably practicable.

SLIDE 26 – Effects of Control Measures
- Having described the theoretical basis and practical aspects of the strategy, the next step is to determine how effective the controls have been. There are two ways of looking at this:
  - The impact on exposure levels
  - The impact on health

SLIDE 27 – Effect of LEV on Mean Exposure
- Starting with the effect of local exhaust ventilation and exposure levels. The next table (Table 2) shows the mean exposures for sieving and weighing jobs before and after the application of local exhaust ventilation.

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**Table 2 – Mean Exposures (mg.m\(^{-3}\)) Without and With Local Exhaust Ventilation**

<table>
<thead>
<tr>
<th>Job</th>
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<th>With LEV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sieving</td>
<td>15.8</td>
<td>8.7</td>
</tr>
<tr>
<td>Weighing</td>
<td>17.8</td>
<td>2.7</td>
</tr>
</tbody>
</table>

- For both jobs the mean exposures were above 10 mg.m\(^{-3}\) without local exhaust ventilation but came within the 10 mg.m\(^{-3}\) limit after LEV had been installed.

**SLIDE 28 – Effect of LEV on Maximum Exposure**

- However, this is not the whole story because the following table (Table 3) shows the effect of LEV on maximum exposures.
- As the range of exposures for different jobs varies considerably, it is necessary to consider not just the mean exposure, but also the maximum exposure.
- Even with LEV, it is still possible to see some exposures for sieving operations, which fall outside the 10 mg.m\(^{-3}\) MEL.
- Due to poor work practices or poorly maintained LEV
- We focus on these issues at routine reviews and surveys

**Table 3 – Maximum Exposures (mg.m\(^{-3}\)) Without and With Local Exhaust Ventilation**

<table>
<thead>
<tr>
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<th>Without LEV</th>
<th>With LEV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sieving</td>
<td>28.5</td>
<td>21.2</td>
</tr>
<tr>
<td>Weighing</td>
<td>45.7</td>
<td>8.0</td>
</tr>
</tbody>
</table>

**SLIDE 29 – Effects on Symptomatic Sensitisation**

- Turning to the issue of impact on health, the next chart shows the annual number of cases of symptomatic sensitisation, i.e. asthma or rhinitis caused by allergy, across RHM. The cases are attributed to the year in which symptoms began.

*Figure 4 – Summary of New Cases of Symptomatic Sensitisation*
• It is interesting to note that, since 1998, there has been a dramatic fall in the number of new cases.
• This would have been even more marked but for four cases in 2000 which occurred in a company that was acquired in May 1998 and had significantly poorer dust control than existing RHM bakeries.
• Even taking this into consideration, the incidence of symptomatic sensitisation fell from 2085 per million employees per year in the five years up to 1998, to 405 per million employees per year for the five years from 1998 onwards.

SLIDE 30 –Effect of Control Measures in RHM
• It is possible to summarise the effect of the RHM control strategy as follows:
  o In terms of exposure levels the impact has had some benefits but cannot ensure that all individual exposures fall within the statutory Maximum Exposure Limit of 10 mg.m⁻³.
  o On a much more encouraging note, in terms of the reduction in sensitisation, the impact on health has been quite marked.