Controlling exposure to poultry dust

Guidance for employers

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Poultry dust: What is it?

1 This guidance is aimed at employers. It will help you to protect workers from health risks arising from poultry dust.

2 People working in poultry houses breathe in a host of different airborne particles, which collectively are referred to as poultry dust.

3 Poultry dust may vary in composition from pure wood dust to a complex mixture of organic and inorganic particles, faecal material, feathers, dander (skin material), mites, bacteria, fungi and fungal spores, and endotoxins depending on the type of birds, the work activity and the point in the growing or production cycle.

4 The dust can harm the respiratory system (nose, throat, airways and lungs) and workers may experience a range of symptoms, including a sore throat, coughing, wheezing, shortness of breath, bronchitis and even occupational asthma. Workers may also experience flu-like symptoms.

5 A statement of evidence[1] has been prepared, which describes the composition of poultry dust and its health effects in more detail.

6 The Health and Safety Laboratory (HSL) carried out an extensive survey[2] of this industry. It showed that workers undertaking certain tasks in poultry houses were exposed to high concentrations of poultry dust, in some cases for prolonged and repeated periods. This guidance focuses on those activities or tasks that place workers at greatest risk and gives simple, practical advice about how to protect your workers' health.

7 Poultry dust is defined as a substance hazardous to health under the *Control of Substances Hazardous to Health Regulations 2002 (COSHH) (as amended)*.[3] Because the dust can contain asthmagens, the requirements of COSHH apply, and exposure to poultry dust at work should be reduced to as low a level as is reasonably practicable.

What the law says

8 COSHH sets out the legal requirements to protect workers against health risks arising from hazardous substances used at work. Under COSHH, employers (including self-employed people and contractors) have a duty to carry out a suitable and sufficient risk assessment and take steps to ensure exposure is prevented or adequately controlled.

9 COSHH states that where it is not reasonably practicable to prevent exposure to a hazardous substance, control of that exposure shall only be treated as adequate if:

- the principles of good practice for the control of exposure (set out in Schedule 2A to the COSHH Regulations) are applied;
- any workplace exposure limit (WEL)[1] is not exceeded; and
- for a substance that has the potential to cause occupational asthma, exposure is reduced to as low a level as is reasonably practicable.

10 The Regulations place emphasis on reducing exposure to as low a level as reasonably practicable.

11 Good control practice includes engineering controls, such as enclosure and ventilation, systems of work and personal behaviour. For certain activities, particularly dusty activities, suitable respirators will also be necessary. Respirators should only be used as a last line of protection to control exposure, in addition to and not as a substitute for other control measures.

12 This guidance has been produced in partnership with the poultry industry to enable those working in the industry to comply with their main duties under COSHH – to identify the risks and apply appropriate control measures.[3]

13 In all cases, employers should consult their workers or their representatives when assessing risks and making decisions about control measures. Good communication and co-operation are essential if control measures are to be accepted and adopted by the workforce.

Respiratory protective equipment (RPE)

14 RPE will remain the main means of controlling exposure to poultry dust for many workers.

15 The benchmark standard within this guidance lays down the **minimum** levels of protection that should be provided for a range of common activities. Your risk assessment will help you to put appropriate measures in place to meet the required standards. A different level of protection may be appropriate or required in some cases. See Appendix 1 for further information.

Managing contractors

16 Contractors often carry out the tasks covered by this guidance. This sometimes causes confusion over who is legally responsible for providing worker protection. Appendix 2 contains some basic advice that may help to clarify the respective responsibilities of clients (farmers, growers and producers) and contractors for ensuring the health and safety of workers in situations that may occur on poultry farms.

Health surveillance

17 Poultry dust can contain asthmagens so all workers in poultry houses should be subject to regular health surveillance. Appendix 3 describes an appropriate scheme. A suitably qualified medical practitioner or occupational health nurse should be appointed to provide specialist advice and to carry out further investigations when necessary.

Benchmark standards

18 This section describes a range of common activities observed on poultry farms during the HSL survey and specifies, for each activity, the measures agreed with industry that should be taken to protect workers' health. These measures constitute 'good working practice' and are the 'benchmark standards' against which you should compare your own controls.

19 The highest exposure levels (total inhalable dust, bacteria, fungi and endotoxins) measured by HSL are listed for each activity that was monitored during the survey. The opportunity was not available to carry out atmospheric sampling for every activity. These levels are time-averaged over the sampling periods. Full details of the sampling results are contained in the HSL survey report[2] **(short-term peak levels may be much higher than the levels recorded in the HSL report)**.

20 The need to protect workers' health and safety should always be taken into account when designing and constructing new poultry houses or selecting and purchasing new vehicles and equipment to service the buildings. The same applies to the introduction of systems of work for carrying out both routine and periodic tasks.

Construction of new poultry houses

21 When constructing new poultry houses, the following points will help you to meet the minimum benchmark standards:

- Design new sheds to eliminate horizontal surfaces that collect dust, with smooth surface finishes and level concrete floors to facilitate cleaning. Maintain these in good condition.
- The height of new sheds should be tall enough (at the eaves and/or to the bottom of raised feeders or drinkers) to allow the use of a vehicle fitted with an enclosed, ventilated cab with filtered air intakes to clean the whole of the floor. A minimum headroom of 2.1 m is recommended throughout the building.
- Electrical installations and equipment, especially fan motors, should be constructed and installed to a suitable IP rating to prevent water ingress.

Laying down bedding/litter

Laying down whole straw by hand

22 Typical activities include:

- the daily addition of litter in a duck-growing shed;
- adding straw to nest boxes etc by tearing a slice from a bale; and
- scattering straw by hand while holding the slice under the arm.

Table 1 Highest exposure levels measured

Manual daily addition of whole straw by hand	
Total inhalable dust	84.5 mg/m^3
Bacteria	1.37 x 10^8 cfu/m^3
Fungi	2 690 cfu/m^3
Endotoxins	38 903 Eu/m^3

Benchmark: minimum standards

- Minimise application by hand alone, especially by tearing a slice of straw from a bale. Consider alternative methods such as mechanical spreading.
- Introduce manual working practices that minimise the release of dust (mould).
- Specify clean, dry, mould-free straw from the supplier. Store in a clean, dry, well-ventilated space to reduce the growth of mould. Check its condition before use. Rotate straw stores – use the oldest first and reserve the best straw for hand application.
- Use shed ventilation (mechanical and/or natural) to maximum effect to reduce exposure. This should involve a combination of opening or closing shed doors, opening vents for natural air dilution and switching on ventilation fans to create the required airflow during the different stages of litter placement/laying.
- Take a precautionary approach to control and wear filtering RPE with an assigned protection factor (APF) of at least 20, eg FFP3 (see Appendix 1).

Laying down whole straw by machine

23 Typical activities involve:

- laying the initial straw bed in duck growing sheds;
- cutting bales of whole straw and distributing by a straw chopper mounted on or towed by a vehicle;
- adding additional litter on a daily basis;
- dispersing birds when adding straw in houses that have already been populated.

24 This task was not included in the HSL sampling survey.

Benchmark: minimum standards

- Where necessary, to achieve adequate control of exposure and where reasonably practicable, fit vehicles used for transferring and/or spreading litter with enclosed, ventilated cabs fitted with filtered air intakes.
- Where the use of such vehicles is reasonably practicable, vehicles that do not meet the above standard should be phased out.
- Keep cab windows closed during transit through the shed.
- Use a system of work to minimise exposure, eg restrict spreading to a single pass if an assistant needs to disperse birds in front of the tractor.
- Assistants should wear filtering RPE with an APF of at least 10, eg FFP2 where dust exposure is likely (see Appendix 1).
- Specify a re-entry time (eg 30 minutes) for the air to clear after spreading.

Laying down chopped straw, wood shreds or shavings by machine

25 Typical activities include laying down the initial layer of litter in rearing or growing sheds. Litter may be received in a bale or in bulk form and spread by a drag-box, plough or rotary spreader mounted on a mini-tractor or skid-steer loader. Some spreaders have integral feed hoppers. Litter is hand-raked around roof support posts and into corners.

Table 2 Highest exposure levels measured

Laying down wood shreds by machine	
Total inhalable dust	34.8 mg/m^3
Bacteria	2.00 x 10^7 cfu/m^3
Fungi	600 000 cfu/m^3
Endotoxins	224 Eu/m^3

Benchmark: minimum standards

- Purchase dust-extracted wood shreds or shavings.
- Purchase mould-controlled, dust-extracted chopped straw.
- Select equipment and introduce ways of working for both transferring litter into sheds and spreading litter that will minimise exposure, eg purchase bales rather than bulk to allow direct delivery into sheds, blow bulk litter into sheds, etc.
- Use shed ventilation (mechanical and/or natural) to maximum effect to reduce exposure. This should involve a combination of opening or closing shed doors, opening vents for natural air dilution and switching on ventilation fans to create the required airflow during the different stages of litter placement/laying.
- Where necessary, to achieve adequate control of exposure and where reasonably practicable, fit vehicles used for transferring and/or spreading litter with enclosed, ventilated cabs fitted with filtered air intakes.
- Where the use of such vehicles is reasonably practicable, vehicles that do not meet the above standard should be phased out.
- Drivers of vehicles that do not have enclosed, ventilated cabs with filtered air intakes, or who do not keep the cab doors or windows closed, must wear RPE.
- Where RPE is required, workers removing transferring and/or spreading litter should wear filtering RPE with an APF of at least 20, eg FFP3 (see Appendix 1).
- Introduce low-dust practices for cleaning vehicles, spreading machinery and equipment, eg wash or use vacuum cleaners and avoid blowers and compressed airlines.

Laying down chopped straw, wood shreds or shavings by hand

26 Typical activities include laying down the initial layer of litter or topping-up litter in rearing or growing sheds. Polythene-wrapped bales should be opened by hand and litter should be spread over the floor using forks or rakes.

27 This task was not included in the HSL sampling survey.

Benchmark: minimum standards

- Purchase dust extracted wood shreds or shavings.
- Purchase dust-extracted chopped straw that is chemically treated to control microbial growth.
- Reduce exposure by shed ventilation (mechanical and/or natural) during spreading. This should involve a combination of opening or closing shed doors, opening vents for natural air dilution and switching on ventilation fans to create the required airflow.
- Use systems of work to minimise exposure, eg work upwind, roll up polythene wrapping rather than folding it.
- Wear suitable filtering RPE with an APF of at least 10, eg FFP2 (see Appendix 1).

Populating houses

Egg production: point of lay (POL) for hens – barn and colony systems

28 Typical activities include:

- the POL hens being delivered to the farm in crates stacked in wheeled modules;
- modules are either pushed or mechanically raised to the unloading station(s); and
- hens are lifted from the crates and placed in the houses or colony units.

29 Dust comes directly from birds themselves, ie dander, faecal residues and feathers. The dust is high in protein with an increased risk of respiratory sensitisation.

Table 3 Highest exposure levels measured

Populating POL hens into a colony system	
Total inhalable dust	23.8 mg/m^3
Bacteria	5.13 x 10^7 cfu/m^3
Fungi	11 000 cfu/m^3
Endotoxins	1 441 Eu/m^3

Benchmark: minimum standards

- Reduce exposure by shed ventilation (mechanical and/or natural) during population.
- Introduce systems of work to minimise exposure, eg rotate jobs and workstations.
- Wear suitable filtering RPE with an APF of at least 10, eg FFP2 (see Appendix 1).
- Exclude all bystanders from the shed during population, as far as possible. If authorised persons are present, consider their need for RPE.

Broiler production/rearing farms: day-old chicks (DOCs)

30 Typical activities include:

- a pathway being cleared through the litter down the centre of the shed;
- wheeled modules carrying trays of DOCs are then pushed down this pathway to the centre of the house;
- trays are emptied onto the litter on either side of the pathway; and
- the litter is pulled back over the pathway.

31 Dust comes directly from birds themselves, ie dander, faecal residues and feathers. The dust is high in protein with an increased risk of respiratory sensitisation.

Table 4 Highest exposure levels measured

Populating DOCs on a broiler farm	
Total inhalable dust	5.5 mg/m^3
Bacteria	2.7 x 10^6 cfu/m^3
Fungi	38 400 cfu/m^3
Endotoxins	623 Eu/m^3

Benchmark: minimum standards

- Subdue lighting to keep birds calm.
- Members of chick gangs should wear filtering RPE with APF of at least 10, eg FFP2 (see Appendix 1).
- Work quietly and place birds gently onto the floor.

Turkeys and ducks

32 Typical activities for broiler production include some birds being moved at a later stage, eg when seven weeks old, to fresh accommodation. At this later stage, birds are transferred in wheeled modules as POL hens.

33 Dust comes directly from birds themselves, ie dander, faecal residues and feathers. The dust is high in protein with an increased risk of respiratory sensitisation.

34 This task was not included in the HSL sampling survey.

Benchmark: minimum standards

- Reduce exposure by shed ventilation (mechanical and/or natural) during population.
- Catchers and fork-lift truck drivers wear RPE with an APF of at least 10, eg FFP2 (see Appendix 1).

Routine flock management

35 Typical activities include routine flock management. It covers a range of tasks including inspection, weighing, beak trimming, vaccination, collection of stray eggs etc. The tasks depend on the type of farm and the point in the production cycle.

36 This task was not included in the HSL sampling survey.

37 It is difficult to give specific advice about each activity because working practices vary from sector to sector, farm to farm and throughout the growing/production cycle. An additional risk is broken eggs. The contents, when dry to dust, can be inhaled and lead to sensitisation.

Benchmark: minimum standards

- Assess the health risks for individual tasks and their ancillary activities, such as egg packing, to determine the appropriate control measures.
- Workers wear RPE with an APF of at least 10, eg FFP2 when performing tasks involving working among live birds. This is the normal expectation (see Appendix 1).
- Reduce exposure by shed ventilation (mechanical and/or natural). This should involve a combination of opening or closing shed doors, opening vents for natural air dilution and switching on ventilation fans to create the required airflow.
- Disturb the birds and litter as little as possible.
- Perform tasks when dust levels are naturally at their lowest, eg when birds are not dust-bathing.

Routine house cleaning

Egg production: colony system only

38 Typical activities include routine house cleaning, which involves a mixture of tasks including:

- clearing dust and debris from the aisles, walkways and surrounding structures;
- cleaning colony units and floors;
- cleaning and sterilising the ends of the colony units, especially the egg and feed conveyors; and
- removing deposits from muck elevators.

39 This task involves the use of hand tools (brushes and scrapers) as well as powered equipment and machinery.

40 The dust contains large amounts of bird proteins and mite residues. The dust carries a high risk of respiratory sensitisation. Such dust may also affect bird health.

Table 5 Highest exposure levels measured

Routine cleaning using hand tools		Using compressed airlines to clean down a colony system	
Total inhalable dust	4.0 mg/m^3	Total inhalable dust	180.0 mg/m^3
Bacteria	1.38 x 10^6 cfu/m^3	Bacteria	3.44 x 10^7 cfu/m^3
Fungi	6 000 cfu/m^3	Fungi	61 600 cfu/m^3
Endotoxins	249 Eu/m^3	Endotoxins	58 000 Eu/m^3

Benchmark: minimum standards

- Use shed ventilation (mechanical and/or natural) to maximum effect to reduce exposure. This should involve a combination of opening or closing shed doors, opening vents for natural air dilution and switching on ventilation fans to create the required airflow.
- Wherever possible, introduce procedures that minimise dust production, eg vacuuming and wet cleaning (eg mopping).
- The use of blowers and compressed airlines should be kept to a minimum. This process generates high levels of dust. If they are used, then workers should use ventilation and wear RPE with an APF of at least 20, eg FFP3 (see Appendix 1). Where reasonably practicable a silencer (eg low-noise air nozzle) should be fitted to the end of compressed airlines to reduce noise exposure.
- Never use blowers or compressed airlines to clean clothing.
- Provide good washing and welfare facilities.
- Manage and organise the cleaning of laying areas to minimise exposure of other workers.
- For other cleaning duties, not involving the use of blowers and compressed airlines, take a precautionary approach to control and wear RPE with an APF of at least 10, eg FFP2 (see Appendix 1).

Catching/depopulating

41 Typical activities include catching/depopulation or thinning of birds by hand, often using a modular transport system.

42 Dust contains large amounts of bird proteins and mite residues. The dust carries a high risk of respiratory sensitisation.

Table 6 Highest exposure levels measured

Catching and depopulating birds by hand	
Total inhalable dust	10.4 mg/m^3
Bacteria	1.55 x 10^7 cfu/m^3
Fungi	39 300 cfu/m^3
Endotoxins	16 600 Eu/m^3

Benchmark: minimum standards

- Promote automated or mechanical catching of broilers where this is a viable alternative to manual catching.
- Introduce systems of work that minimise bird disturbance and dust exposure;
- Rotate work activities/stations to reduce the individual worker's exposure (especially for removal of birds from cages).
- Reduce exposure by shed ventilation (mechanical and/or natural). This should involve a combination of opening or closing shed doors, opening vents for natural air dilution and switching on ventilation fans to create the required airflow.
- Use subdued lighting to keep birds calm.
- All catchers, including fork-lift truck drivers, should wear suitable filtering RPE with an APF of at least 10, eg FFP2 (see Appendix 1).

Litter/manure removal

Broilers and rearing farms

43 The process of litter/manure removal from broiler sheds typically involves the:

- removal of settled dust from roof trusses, feeders, stanchions, vents, fans and casings (working both inside and outside the shed);
- removal of litter/manure from the shed floor, using a front end or skid steer loader to shovel the bulk of the litter from the shed floor into a waiting lorry/trailer; and
- removal of residual litter.

Table 7 Highest exposure levels measured

Removing manure from a broiler shed	
Total inhalable dust	33.1 mg/m^3
Bacteria	2.00 x 10^8 cfu/m^3
Fungi	26 700 cfu/m^3
Endotoxins	1 140 Eu/m^3

44 Rotary brushing of shed floors can cause exceedingly high peak dust levels (up to 500 mg/m^3). This is approaching a dust concentration that if ignited could result in a dust explosion.

Benchmark: minimum standards

- Use shed ventilation (mechanical and/or natural) to maximum effect to reduce exposure. This should involve a combination of opening or closing shed doors, opening vents for natural air dilution and switching on ventilation fans to create the required airflow during the different stages of litter/manure removal.

RPE and PPE

- Where RPE is required, workers removing litter/manure and cleaning sheds should wear filtering RPE with an APF of at least 20, eg FFP3 (see Appendix 1).
- Ear protection should be used when using compressed airlines.
- If using a pressurised water system, workers should wear suitable personal protective equipment (PPE), including a waterproof suit, wellington boots, safety goggles, gloves, ear protectors and RPE (as described above).

Initial removal of dust from roof trusses, raised feeders/drinkers etc

- The use of blowers and compressed airlines should be kept to a minimum; this process generates high levels of dust.
- Where the use of portable blowers or compressed airlines is justified (eg by risk assessment), workers should maximise the use of ventilation, wear RPE as described above and follow a safe system of work (eg working away from ventilation intakes and towards ventilation fans). A low-noise air nozzle should be fitted to the end of compressed airlines to reduce noise exposure at the source. When outside the shed cleaning fans and housings with compressed airlines, the wind direction should be considered and workers should begin the task upwind wherever possible so that airborne dust is blowing away from the worker.
- Wherever possible, use procedures that minimise dust generation, eg vacuuming, pressure washing or suppressing the dust (eg by applying a fine water mist throughout the shed). Initially wetting or dampening the litter/manure will help reduce the amount of airborne dust.

Removal of litter/manure

- Where necessary, to achieve adequate control of exposure and where reasonably practicable, fit vehicles used to remove litter/manure with enclosed, ventilated cabs with filtered air intakes.
- Where the use of such vehicles is reasonably practicable, vehicles that do not meet the above standard should be phased out.
- Doors and windows of such vehicles should remain closed at all times.
- Drivers of vehicles that do not have enclosed, ventilated cabs with filtered air intakes must wear RPE as described above.
- Vehicles should be regularly maintained (eg cab filtration systems, wipers, door/window seals etc).
- Position the collection lorry/trailer so that the loading machine is upwind when tipping.
- Prevent dust build-up outside the shed, and reduce dust dispersed by vehicle movements. When necessary clean or hose down the loading apron.

Removal of residual litter/manure

- The use of blowers and compressed airlines should be kept to a minimum. Where the use of portable blowers or compressed airlines is justified (by risk assessment), then workers should maximise the use of ventilation, wear RPE as described above and follow a safe system of work (eg working away from ventilation intakes and towards ventilation fans). A low-noise air nozzle should be fitted to the end of compressed airlines to reduce noise exposure at source.
- In sheds where residual litter/manure is dry and where a high level of cleaning is necessary on hygiene grounds, use cleaning methods that create low dust levels, eg vacuuming or an enclosed rotary brush with a water injection system. Do not dry sweep with an unenclosed rotary brush mounted on a skid-steer loader or similar machine, this process generates high levels of dust.
- Workers who hand shovel litter from difficult-to-reach areas, such as corners and around stanchions, should wear RPE as described above.
- Where possible, wash fans and casings, providing fan motors and associated electrical equipment are both isolated and suitably protected against water ingress to a suitable IP rating.
- Never use blowers or compressed airlines to clean clothing.

Egg production: barn/free range/breeder system

45 Typical activities for farms with fixed poultry sheds include the removal of litter/manure. This is for farms operated on the barn system, which is different from broiler farms because all furniture (except the nest boxes) has to be removed before the litter/manure can be accessed. The furniture (feed conveyors, metal grids, timber frames etc) is dismantled by hand and taken outside where it is cleaned and disinfected. Litter from inside the shed is then removed in a similar way, as described for broilers.

46 For farms with mobile poultry sheds, the entire poultry shed is pulled by vehicles and moved along the field. The litter is then exposed in the open air and can be easily accessed and removed by any cabbed vehicle. The mobile shed is then moved back into place, ready for cleaning and disinfection.

Table 8 Highest exposure levels measured

Removing manure from a free range barn (fixed poultry sheds)	
Total inhalable dust	107.7 mg/m^3
Bacteria	9.13 x 10^7 cfu/m^3
Fungi	80 900 cfu/m^3
Endotoxins	1 190 EU/m^3

Benchmark: minimum standards

- Controls are the same as for broiler farms (see Litter/manure removal: Broilers and rearing farms).
- All furniture should be given a preliminary clean before being dismantled and removed from the sheds. Wherever possible introduce procedures that minimise dust generation, eg vacuuming, pressure washing or suppressing the dust (eg by applying a fine water mist throughout the shed). Initially wetting or dampening the litter/manure will help reduce the amount of airborne dust.

Egg production: colony system

47 Due to new welfare regulations, companies are replacing their old cages with larger modern systems. Many of these have ventilation and air extraction systems that reduce the amount of dust, as well as conveyor systems that capture/remove the faecal matter to another building/area.

48 Cleaning of the colony units and walkways etc within these large buildings takes place regularly (ie daily, weekly or fortnightly, depending on the task) as described in Routine house cleaning.

49 The litter/manure is regularly emptied from these large, purpose-built storage buildings/areas. The height of these buildings also means that larger vehicles can be used instead of the small machines, which are typically used in smaller poultry sheds.

Table 9 Highest exposure levels measured

Removing manure from a deep pit colony system	
Total inhalable dust	35.4 mg/m^3
Bacteria	8.04 x 10^6 cfu/m^3
Fungi	41 200 cfu/m^3
Endotoxins	6 192 Eu/m^3

Benchmark: minimum standards

- Controls for cleaning are the same as described in Routine house cleaning.

Litter removal from central storage buildings/areas

- Use ventilation (mechanical and/or natural) to maximum effect to reduce exposure. This should involve a combination of opening or closing shed doors, opening vents for natural air dilution and switching on ventilation fans to create the required airflow.
- Where necessary, to achieve adequate control of exposure and where reasonably practicable, fit vehicles used to remove litter/manure with enclosed, ventilated cabs with filtered air intakes.
- Where the use of such vehicles is reasonably practicable, vehicles that do not meet the above standard should be phased out.
- Doors and windows of such vehicles should remain closed at all times.
- Drivers of vehicles who do not keep the cab doors or windows closed must wear RPE.
- Where RPE is required, workers should wear filtering RPE with an APF of at least 20, eg FFP3 (see Appendix 1).
- Vehicles should be regularly maintained (eg cab filtration systems, wipers, etc).
- Position the collection lorry/trailer so that the loading machine is upwind when tipping.
- Prevent dust build-up inside the shed, and reduce dust dispersed by vehicle movements. When necessary clean or hose down the building.

House cleaning, disinfection and fumigation

Broilers and rearing farms

50 Typical activities involve sheds being washed down and disinfected after removal of litter/manure. The internal structure is first sprayed with detergent to loosen deposits, then pressure hosed with clean water and finally sprayed with disinfectant. Sheds are sometimes fogged or fumigated with biocide.

Table 10 Highest exposure levels measured

Cleaning a broiler shed using high pressure water jets	
Total inhalable dust	3.6 mg/m^3
Bacteria	4.71 x 10^5 cfu/m^3
Fungi	180 000 cfu/m^3
Endotoxins	328 Eu/m^3

Benchmark: minimum standards

- Wear suitable PPE and RPE (as defined by your risk assessment) when applying detergent to loosen remaining hardened deposits.
- When using a pressurised water system to clean the shed, workers should wear suitable PPE including a waterproof suit, wellington boots, gloves and ear protectors, and wear suitable filtering RPE with an APF of at least 10, eg FFP2 (see Appendix 1).
- Wear suitable PPE and RPE when spraying disinfectant applied through a pressure washer. Always follow the manufacturer's instructions when using a disinfectant. Avoid products labelled R43 (may cause sensitisation by skin contact) or H317 (may cause an allergic skin reaction) if possible.

Fogging/fumigation

- All fogging/fumigation technicians must be competent. The British Pest Control Association (BPCA) runs suitable training courses.
- Follow the manufacturer's instructions when fogging/fumigating sheds.
- Prevent access to sheds when fogging/fumigation is in progress. Keep sheds secure while under fumigation to prevent unauthorised access. Display warning signs at all entry points.
- Wear suitable RPE to enter the plant room at the end of the fogging/fumigation period and to start the ventilation fans. Check the product instructions for details.
- At the end of the fogging/fumigation period, the person in charge should declare the shed safe for reoccupation.
- Further information can be found in *Fumigation: Health and safety guidance for employers and technician carrying out fumigation operations*.[4]

Egg-production: barn/free range/breeder system

51 Typical activity involves all furniture, except the nest boxes, being dismantled and taken outside where it is cleaned and disinfected. The inside of the shed is then cleaned and disinfected.

52 This task was not included in the HSL sampling survey.

Benchmark: minimum standards

- All furniture should be removed from the sheds, cleaned and disinfected outside – mats etc are pre-soaked, pressure washed then disinfected.
- Application of disinfectant: follow manufacturer's instructions and wear RPE depending on application method.
- Controls for cleaning, disinfection and fumigation/fogging of egg-production poultry sheds are the same as for broiler houses (see House cleaning, disinfection and fumigation: Broilers and rearing farms).

Egg production: colony system

53 Typical activity includes cleaning of the colony systems, which takes place more frequently than on broiler or barn farms. Colony units are typically cleaned on a weekly or fortnightly basis as described in Routine house cleaning.

54 At the end of the crop cycle when the birds have been removed (approx 50–60 weeks) the units are cleaned and then washed and disinfected.

Table 11 Highest exposure levels measured

Total inhalable dust	67.9 mg/m^3
Bacteria	4.36 x 10^6 cfu/m^3
Fungi	10 000 cfu/m^3
Endotoxins	4 014 Eu/m^3

Benchmark: minimum standards

- Controls for cleaning are the same as described in Routine house cleaning.
- Controls for disinfection and fumigation are the same as for broiler houses (see House cleaning, disinfection and fumigation: Broilers and rearing farms) where appropriate.
- Wear RPE depending on the application method.

Glossary

total inhalable dust inhalable dust approximates to the fraction of airborne materials that enters the nose and mouth during breathing and is therefore available for deposition in the respiratory tract.

bacterial bacteria in poultry dust may be derived from soil or dust generally present in any agricultural environment, and from feed and bedding/litter, as well as from the birds themselves (faecal or skin microflora, zoonotic agents). Their presence may constitute a risk to the human health of workers either through overt infection or through an immunological or toxic challenge to the respiratory system as a result of the biological burden.

endotoxin endotoxins are present in poultry dust at all stages of the production cycle. Endotoxins are released after the breakdown of the cell wall of gram negative bacteria. Evidence supports endotoxin exposure at work being linked to a variety of reported work-related symptoms, such as fever, cough, shortness of breath, wheezing and chest tightness, headache, upper airways irritation, and acute airway obstruction, and inflammation. Health effects associated with endotoxin exposure are often non-specific in nature (ie not causing a specific disease), and may be associated with reduced lung function.

fungi fungi in poultry dust may be derived from soil and dust generally present in any agricultural environment, and from feed and bedding/litter, but to a lesser extent from the birds themselves. Long-term or repeated exposure to high concentrations of airborne fungal spores is recognised as contributing to a decline in lung function and allergic disease such as asthma and farmers lung.

asthmagen occupational asthma is an allergic reaction that can occur in some people when they are exposed to certain substances in the workplace, eg grain, storage mites and fungal spores. These substances are called respiratory sensitisers or ‘asthmagens’ and form some of the constituents of poultry dust. They can cause a change in people’s airways, known as the ‘hypersensitive state’. Not everyone who becomes sensitised goes on to get asthma. But once the lungs become hypersensitive, further exposure to the substance, even at quite low levels, may trigger an attack.

Appendix 1: RPE

1 RPE will remain the main means of controlling exposure to poultry dust for many workers.

2 The benchmark standard in this guidance lays down the **minimum** levels of protection that should be provided for a range of common activities. Local risk assessment should confirm that the standard will provide adequate protection in actual working conditions. A different level of protection may be appropriate or required in some cases.

3 RPE should be capable of providing adequate protection and should fit the wearer properly. Take all factors into account when selecting the equipment, eg the nature of the work, the working environment and the features of the wearer, eg face shape, facial hair, spectacle wearer. Other risks, eg the risk of eye infection, will also need to be taken into account.

4 The workers themselves should be involved in the selection process.

5 All RPE should be manufactured to a suitable standard and should be CE marked. Nuisance disposable dust masks do not provide protection against harmful dusts and should never be used at work. They are not CE marked.

6 Selecting the right respirator for each user is essential. It is unlikely that one particular type or size of respirator will fit everyone.

7 Face fit testing (either qualitative or quantitative) should be carried out for all respirators that rely on a good face seal to be effective, ie disposable, half and full-face masks.

8 Face fit testing ensures that the respirator is capable of fitting properly.

9 Fit testing is not required for loose-fitting equipment such as ventilated visors and hoods.

10 Facial hair affects the performance of close-fitting respirators, so faces should be clean shaven for optimum performance. Workers with beards should be provided with ventilated hoods or visors.

11 All users of RPE should be adequately instructed and trained in its correct use and, in particular, should be shown how to check the fit before each use. The simplest seal check is as follows:

- put on the respirator and tighten the straps;
- block the filter or the filtering surface with the hands without deforming it; and
- inhale gently to create a slight vacuum and the respirator should flatten slightly. If not, there is a leak in the seal.

12 The procedure is illustrated in the *Toolbox talk on poultry dust*.[5]

13 Workers must make full and proper use of RPE and farm managers, as well as team leaders and supervisors, have a duty to ensure that it is worn properly at the correct times. RPE should be worn continuously throughout the work period; otherwise its benefit will be lost.

14 All re-usable RPE should be checked for correct operation before each use in accordance with the manufacturer's or supplier's instructions. The equipment should be regularly cleaned and maintained and should be disinfected between use on different farms. Make sure the filters are replaced when used or damaged, in accordance with the manufacturer's instructions. The equipment should be stored in a clean and safe place when not in use. It should not be left lying around the workplace or in the back of a van.

15 Experience should determine how often disposable respirators are changed but they should never be used for more than one shift. Replacement masks should be readily available at the point of use.

16 More detailed information on managing RPE can be found in *Respiratory protective equipment at work: A practical guide*.[6]

Appendix 2: Managing contractors

1 This appendix is intended to help poultry farmers to understand their legal responsibilities for health and safety when they use contractors to carry out work on their farms, eg laying down litter, catching birds, removing manure, cleaning houses etc. It explains good practice, which should ensure that all risks are properly managed.

2 In this situation, the farmer and the contractor share responsibility for managing the health and safety of the contractor's workers but the extent of each party's responsibility will depend on the exact circumstances. Although primary responsibility remains with the contractor, as their employer, the farmer attracts a range of duties which include:

- selecting a competent and reliable contractor;
- preparing and agreeing a service contract;
- providing site induction;
- co-ordinating activities to minimise the risks;
- checking the performance of the contractor; and
- reviewing the contractor's performance.

Selecting a competent and reliable contractor

3 Contractors should be selected with care and health and safety should be a key consideration in the selection process. Before awarding a contract, the farmer should assess the ability and competency of all potential contractors to manage health and safety. Useful evidence includes copies of health and safety policy statements, risk assessments, training records and public/employer liability insurance.

4 The selected contractor should be familiar with this industry benchmark standard and should have sufficient resources, especially suitable equipment and machinery, to ensure workers are adequately protected.

Preparing and agreeing a service contract

5 Contractors invited to tender should be made fully aware of how the work should be done and the standard of health and safety expected of them. Contractors' responsibilities for health and safety, eg the provision of RPE, should be agreed and confirmed in writing in the terms of a formal contract. The contract should spell out exactly what the contractor has to do to meet his responsibilities for health and safety. The arrangements for first aid and welfare should also be agreed. There should be no doubt about who is responsible for what.

Providing site induction

6 Communication is a key element of managing contractors. Every contractor should be made aware of any hazards on the farm that may affect workers, eg traffic movements, and should be made aware of the farm's health and safety rules and procedures.

7 All workers should be given a brief site induction on arrival to explain the safety rules and procedures, especially what to do in the event of an emergency.

8 A site contact should be appointed to liaise with the contractor's representative This person should normally be the farm manager.

Co-ordinating activities to minimise the risks

9 The activities of resident farm workers and those of the contractor should be co-ordinated to minimise the risks to both sets of workers, eg resident workers should avoid blowing down colony units while contractors are performing work below them, such as scraping belts and perches.

Checking the performance of the contractor

10 Contractors are responsible for supervising their own workers and monitoring their own health and safety performance. However the farmer should make periodical checks on the contractor to make sure that the work is being done as agreed in the contract. Farmers should not just leave contractors to get on with the job and turn a blind eye to unsafe practices and disregard for safety rules. Farmers should be positive and carry out checks and inspections. Farm staff should know what action to take if they find any problems. This should be agreed and included in the contract at the outset.

Reviewing the contractor's performance

11 Both the farmer and the contractor should review the work after completion to see if the performance could be improved in the future.

12 Good communication, co-operation and communication are the crucial factors in the successful management of contractors.

Appendix 3: Health surveillance

1 Poultry dust may contain elements that are respiratory sensitisers (asthmagens). It is therefore essential that health surveillance is undertaken to enquire positively about any early symptoms of ill health. Employers have a legal duty to carry out health surveillance under COSHH (regulation 11 where their COSHH assessment has identified a substance likely to cause asthma and Appendix 3 of COSHH refers).

2 The objectives of health surveillance are to:

- protect the health of individual workers by detecting, as early as possible, symptoms that may be caused by exposure to substances hazardous to health;
- help evaluate the effectiveness of measures taken to control exposure; and
- collect information to update knowledge of health hazards in the workplace.

3 Decisions on the appropriate form of health surveillance may require the advice of an occupational health professional. The precise form of health surveillance will depend on the particular circumstances of exposure (level, frequency and duration) identified by the risk assessment.

4 As a **minimum**, health surveillance should:

- include pre-placement screening that includes a questionnaire about present or past asthma or chest illness;
- inform new starters about what symptoms they should look out for and how to report;
- include the completion of a questionnaire for all workers after employment at six weeks, 12 weeks (or similar intervals) and at least annually thereafter to enquire about any developing symptoms. The questionnaire should be administered by a responsible, trained person who understands the purpose of the questionnaire and how to interpret the answers, as well as what action to take if any adverse effects are found. The responsible person should not be expected to make judgements on the cause of symptoms or other issues related to employability; and
- enable you to keep an individual health record for each worker. This should not include any personal clinical or medical data. Any such information should be treated in confidence and kept separately and securely by the occupational health professional.

5 Lung function testing may also help with assessing a worker's respiratory health. Consideration should be given to the measurement of lung function (preferably by spirometry) at the same intervals, ie pre-placement, six weeks, 12 weeks and annually thereafter.

6 Each employer must also identify a named occupational health professional (doctor or nurse) who can:

- help to develop the scheme;
- train the responsible person;
- advise on any adverse findings from the questionnaire and, in particular, fitness to continue in the work; and
- make arrangements for further investigations where necessary.

7 Each employee should be given information about the health risks associated with exposure to poultry dust, the relevant symptoms to look out for and the need to report any symptoms to the nominated responsible person.

References

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Further information

For information about health and safety, or to report inconsistencies or inaccuracies in this guidance, visit www.hse.gov.uk/. You can view HSE guidance online and order priced publications from the website. HSE priced publications are also available from bookshops.

This document contains notes on good practice which are not compulsory but which you may find helpful in considering what you need to do.

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