Pneumonia MOT

Respiratory disease of cattle (more commonly known as pneumonia), is one of the most significant diseases affecting English beef production. Cattle succumb when the disease pressure overcomes their immune system, which could be caused by a range of management factors. This checklist provides guidance on identifying problem areas.

A separate checklist is available for calf rearing systems at **beefandlamb.ahdb.org.uk**

Animal	
Action	**Interpretation**
Weight for age	
Source cattle that have grown well during early life	Cattle with poor weight for age are likely to be high risk and should be avoided where possible Good nutrition and vaccination will help to boost their immune system
Health status of farm of origin and colostrum	
Source cattle from herds with a known health status. Ensure the farm of origin is BVDFree and that they received sufficient colostrum as calves	Calves that have not had adequate colostrum will have sub-optimal performance and be more susceptible to health problems. Calves that are persistently infected with BVD represent a significant respiratory disease risk to the rest of the herd
Growth rate	
Weigh calves regularly to assess growth rate	Growth rates lower than 0.7kg/day indicate sub-optimal nutrition or health
Body condition score (BCS)	
Manage dry cows and heifers to ensure correct body condition at calving and throughout the year	At calving, aim for spring calvers to have a BCS of 2.5–3.0 and autumn calvers to have a BCS of 3.0 Ideally, the cows should be in the correct BCS six weeks before calving
Trace element profiling	
Ask your vet to assess levels of copper, cobalt, selenium and vitamin E in suitable batches of youngstock	Deficiencies or excessive levels of trace elements can be responsible for impaired immune status

Environment/housing	
Action	**Interpretation**
Bedding	
Bedding should be plentiful, clean and dry	Ensure there is sufficient clean and dry bedding available. There should not be a noticeable squelch when the welly boot is lifted up
Design and dimensions	
Ensure adequate air inlet and outlet areas	The ideal outlet area depends on the stocking density (kg LW/m^2), the average animal weight (kg) and the difference in heights between the inlets and the outlets To calculate ideal outlet and inlet areas, see Page 25: A1: Ventilation calculations
Ensure there are no water leaks	Avoid water leaks from gutters and water troughs
Ventilation	
Ignite at least two smoke emitter pellets at different points within an occupied building on a still day Measure smoke clearance times and observe smoke clearance patterns Assess atmosphere for 'stuffiness' and a lack of fresh air	Observe smoke to identify good and poor areas of ventilation within a building Smoke should ideally travel up and out of outlet areas Slow movement throughout the building indicates a high risk for transfer of pathogens from one affected animal to an entire group due to poor air flow The rate of clearance crudely indicates how frequently air is being changed within a building. Smoke should clear in 30–45 seconds
Observe general cleanliness of the building, eg cobwebs, dust, etc	A build-up of dust or obvious cobwebs are clear signs that ventilation is inadequate, with insufficient air changes occurring
Humidity	
Assess humidity using a humidity meter if available, or visual signs such as rusting and stained roof structures	Relative humidity should be less than 75% to reduce survival of exhaled pathogens and spread between animals Dark stains on purlins or roof sheets and corrosion on steelwork indicate excess humidity
Draughts	
Measure air speed at calf level at multiple points in the shed if possible and use smoke pellets to observe smoke patterns Observe bedding	Take action to avoid draughts at calf level Air speeds over 2m/s will impact the growth rates during cold weather of youngstock weighing less than 300kg For youngstock weighing less than 100kg, wind speeds over 1m/s need to be controlled Air should not be able to move bedding

Environment/housing	
Action	**Interpretation**
Stocking rates	
Measure area of building (length x width) Record number of animals in each weight range, then calculate m^2/head	Eg 325m^2 shed area containing 50 x 400kg cattle = 6.5m^2 per head For minimum recommended space allowances, see page 28: Table A2a If feed is not available ad-lib, check that cattle can all feed at the same time
Transition management	
Take care to minimise stress of cattle moving onto the farm, being weaned or changing rations	Let cattle rest on arrival Try and feed cattle a similar ration to the one they are used to and introduce any new feeds gradually, over 2–3 weeks Avoid making too many changes at the same time, eg do not wean and house on the same day
Transport	
Minimise transport distances and avoid multiple pickup/drop-offs where possible	Transport is a major stressor and minimising the time spent in transit will reduce respiratory disease risk. Avoiding multiple pickup/drop-offs will not only reduce transit time, but also reduce mixing of cattle of different health statuses

Pathogen	
Action	**Interpretation**
Herd health planning	
Review your herd health plan each year with your vet, based on good health and performance records	A herd health plan is a continuous process to improve animal health and welfare Minimising concurrent health issues will mean cattle are better able to fight BRD infection
Review vaccination plans with your vet	Vaccination is a valuable preventative strategy for controlling BRD. It not only helps protect the animal against BRD, but also reduces the challenge to other cattle in the group
Testing for disease	
Ask your vet to take samples to find out which pathogens are causing disease	These results will help determine the best course of treatment and future prevention strategies
Ensure there are no BVD persistently infected (PI) animals in the herd	PI cattle have a high likelihood of dying in their first year of life Their liveweights are lower than healthy counterparts and incidence of pneumonia can increase by 43% in healthy cattle sharing air space with a PI animal
Faecal sampling	
Test faeces for liver fluke, enteric worms, coccidiosis and lungworm, as appropriate	Faecal sampling can indicate the presence of parasites and indicate how large the burden may be Some pathogens such as lungworm may have a direct effect on respiratory health. Others such as coccidia and liver fluke compromise immune function
Mixing cattle	
Avoid mixing cattle from different source farms and age groups as much as possible	Mixing cattle increases stress and exposure to disease
Shared air space	
Avoid calves sharing the same air space as older cattle	Older cattle can transfer disease to younger cattle even if they are not showing signs of poor health

Pneumonia MOT reference tables

A1: Ventilation calculations

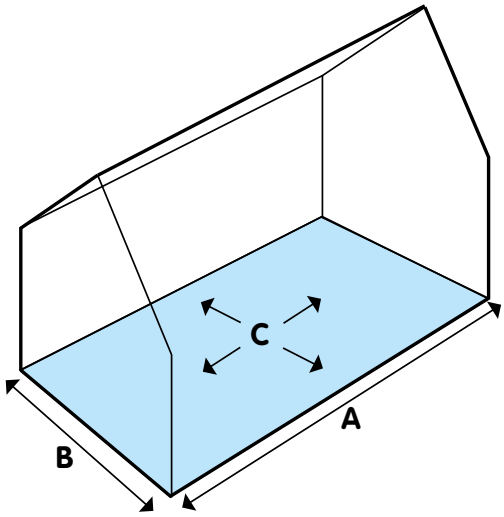
The calculations below estimate the area of outlet and inlet required in a building to ventilate naturally by stack effect.

Insert your own figures in the tables below.

Step 1.

The calculations are shown for the example building:

Building length = 22.86m [**A**]	
Building width = 18.29m [**B**]	
Floor area = A x B = 418m² [**C**]	
Stocking density = 46 cattle [**D**], at average 400kg liveweight (LW)	



Where a range of animal weight occurs, use an average weight. Where there are suckler cows and calves, again use an average weight but consider calves at their heaviest weight. Similarly for growing animals use the expected maximum liveweight that the building will be required to house.

Ventilation calculation key

- **[A]** = Building length
- **[B]** = Building width
- **[C]** = Floor area of the building
- **[D]** = Number of animals
- **[E]** = Floor area each animal has
- **[F]** = Outlet area in the roof per animal
- **[G]** = Eaves to ridge height difference
- **[H]** = Building height factor
- **[I]** = Outlet area required

Floor area per animal = 418m² [**C**] ÷ 46 [**D**] = 9m² per animal [**E**]	

Step 2.

Outlet area per animal – (use Figure A1a on page 27 to calculate)

Read along the horizontal axis of the graph in Figure A1a to the floor area/animal [**E**] and find the line for the relevant weight of animal. Read across to the vertical axis.

For example, a floor area of 9m²/animal at 400kg average liveweight requires an outlet area in the roof per animal of 0.12m² [**F**]	

Step 3.

Eaves to ridge height difference (use A1b on page 27 or use own measurements)

The outlet area in the roof per animal [**F**] needs to be modified by the influence of the pitch of the roof, which is in effect the difference in height between the eaves height and the ridge height.

To calculate the height difference between the eaves and the ridge of a building, either make own measurements, extract the measurement from building plans, or estimate by counting reference points in the gable ends, such as rows of blocks. An alternative is to estimate the slope of the roof and use the multiplier for roof slope below.

Roof slope	Multiplier
10 degrees	0.176
12 degrees	0.213
15 degrees	0.268
17 degrees	0.306
20 degrees	0.364
22 degrees	0.404

Height difference [**G**] = roof slope multiplier x half the building width [**B**]

With a 17° pitch the eaves to ridge height difference of the example building is 0.306 x (0.5 x 18.29 [**B**]) = 2.8m [**G**]	

Step 4.

Outlet area required (use Figure A1b to calculate)

Read along the horizontal axis of the graph in Figure A1b to the height difference of the building. A height difference of 2.8m (the horizontal axis of Figure A1b) corresponds to a height factor (on the vertical axis of Figure A1b) of 0.60 [**H**]

The actual outlet area required [**I**] for this example is:
Outlet per animal [**F**] x height factor [**H**] x number of animals [**D**]

Outlet area required is 0.12m^2 [**F**] x 0.60 [**H**] x 46 [**D**] = 3.31m^2 [**I**]	

Step 5.

The outlet area required is a defined value; how this area is achieved in the ridge is flexible. A common solution is to provide a continuous gap along the ridge, in which case the required gap width is the outlet area required [**I**] divided by the building length [**A**].

In this case the required ridge gap is 3.31m^2 [**I**] ÷ 22.86 [**A**] = 145mm	

The inlet area, ideally split evenly across the two sidewalls is an absolute minimum of twice the outlet area and better at four times the outlet area. In this example, the inlets should be 145–290mm across each side wall. Use the lower figure for youngstock and for exposed sites.

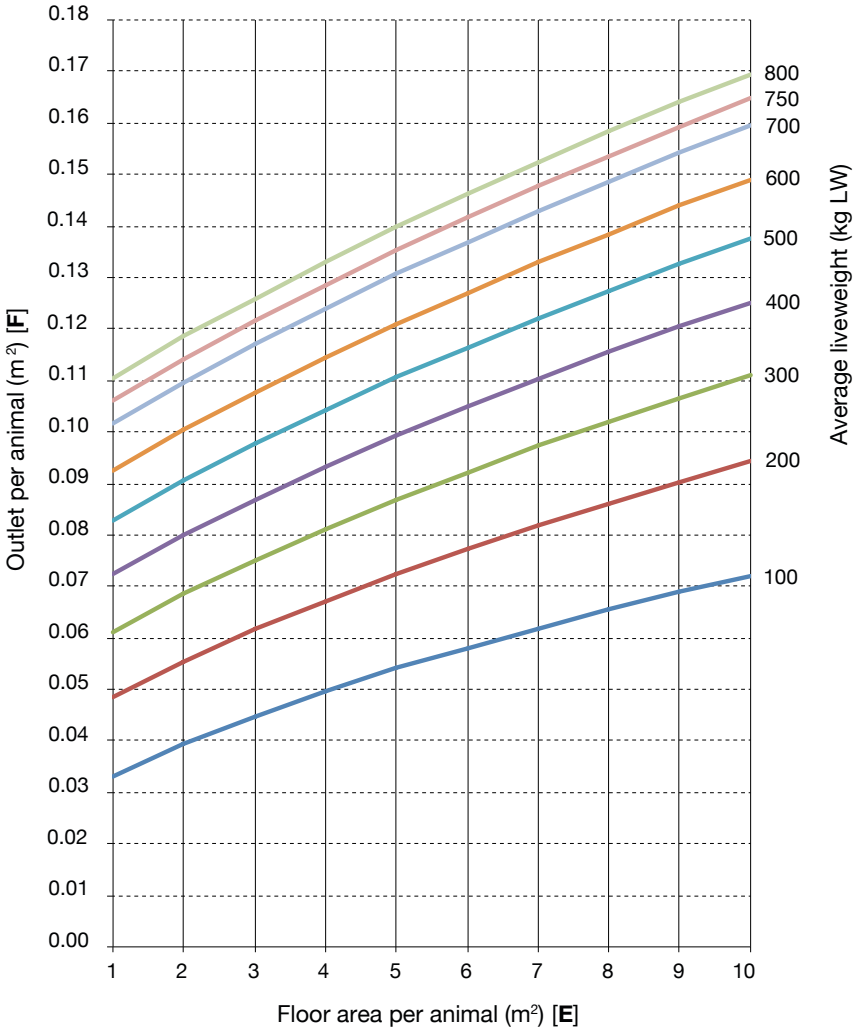


Figure A1a : Outlet area per animal [**F**]

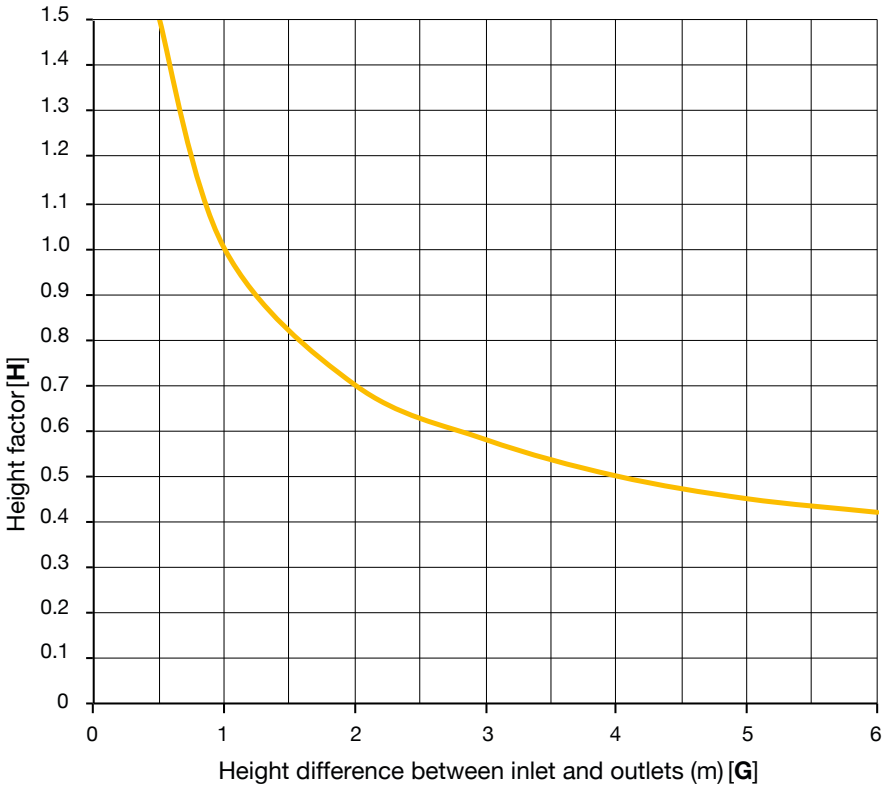


Figure A1b: Building height factor [**H**]

A2. Minimum housing space allowance guidelines

Always check specific requirements of your cattle buyer and farm assurance scheme as many have minimum space allowances.

Table A2a. Loose housing (based on Red Tractor Standards 2017)

	Liveweight (kg)	Solid floors (m^2/head)		Slatted floors* (m^2/head)
		Bedded area	Total area (incl. feeding and loafing)	
Suckler cows	400	3.50	4.90	n/a#
	500	4.25	5.85	n/a#
Growing/ finishing cattle and youngstock	200	2.00	3.00	1.1
	300	2.75	3.95	1.5
	400	3.50	4.90	1.8
	500	4.25	5.85	2.1
	600	5.00	6.80	2.3

*Fully slatted concrete floors should not be used for breeding cows or in-calf replacement heifers.
#Non-slatted lying areas must be provided.

Table A2b. Minimum cubicle dimensions (based on Red Tractor Standards 2017). Cubicle size must be determined by the size of the animal.

	Liveweight (kg)	Dimensions	
		Length (m)	Width (m)
Suckler cows	<600	2.4	1.15
	>600	2.5	1.2
Growing/ finishing cattle and youngstock	200	1.45	0.7
	300	1.7	0.85
	>350	2.1	1.1
	350	2.05	1.05

Table A2c. Minimum space requirements for calves in group housing (Red Tractor Standards, 2017)

Calf weight (kg)	Space requirements per calf
50–84	1.5m^2
85–140	1.8m^2
140–200	2.4m^2

For more information contact:
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If you no longer wish to receive this information, please email us on **comms@ahdb.org.uk**

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