



Animal Health & Performance

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Livestock Management Systems



Buildings' Value



- Modify the environment
 - Shelter from wind and rain
 - Lack of sunlight
 - Lack of space
- Building Management
 - Stocking density
 - Hygiene
 - Maintenance

Building Assessment



- **Space** feeding, drinking, lying and social
- **Fresh air** aerial hygiene, ventilation
- **Air speed** main source of ventilation, major cause of energy loss
- **Moisture** Essential, but often supportive of pathogens, expensive, cold
- **Temperature** Negative impact on growth rates outside thermoneutral range
- **Hygiene** Cleanable?

Space



| | 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 | 2.50 |
| | 500 | 4.25 | 5.85 | 2.75 |
| 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 |

Trough space



| Weight (kg) | Ration fed | Ad-lib / self feed |
|--------------|------------|--------------------|
| 200-299 | 40 | 15 |
| 300-399 | 50 | 15 |
| 400-499 | 55 | 19 |
| 500-599 | 60 | 24 |
| 600-699 | 67 | 28 |
| 700-799 | 70 | 32 |
| 800 and over | 75 | 32 |

Drinkers



- **General cattle water data:**
 - Recommended water flow rates; 10l/min
 - Water depth minimum 80mm to allow muzzle submerged 20-50mm
 - Intakes up to 10% of bodyweight per day.

| | Temperature in °C | | | | |
|--------|-------------------|--------|--------|--------|--------|
| Weight | 4°C | 10°C | 16°C | 21°C | 27°C |
| kg | Litres | Litres | Litres | Litres | Litres |
| 272 | 23 | 25 | 28 | 33 | 38 |
| 363 | 28 | 30 | 34 | 40 | 47 |
| 454 | 33 | 36 | 41 | 48 | 55 |

Ventilation



- Assessment

- Target windspeed within building is 0.5 m/s
- Average wind speed in UK >4.5 m/s
- Any gap wider than 25mm does not control air speed it increases it!
- When wind speed ↓ so does the ventilation rate

Rule of thumb:

1. For adult cattle; outlet in the ridge needs 0.1m² per animal
2. Inlets in each sidewall need to be a minimum of the calculated outlet, twice for higher yielding cattle

Girtridge Buildings'



- **Big Straw shed**

Length = 140ft 42.0m

Building width = 82ft 25m

Building area = 1,049 m²

Roof height difference = 3.28 m @15 degree pitch

Stocking density = max 140 in @ 400kg; out @ 650kg LW

OUTLETS REQUIRED = 11.25m² at ridge height

OUTLETS ACTUAL = 2.68 m² at ridge height

INLETS REQUIRED per side = min 11.25 m²

INLETS ACTUAL = 3.3 m² on each side

Issues



- **Outlet is only 24 % of requirement**
 - Restricting growth
 - Increasing respiratory risk
 - Increasing requirement for straw
- **Inlet is also restrictive at only 29% of requirement**
- **Need to** increase outlet at ridge level
- **Need to** increase inlet to a minimum of 11.25m² on each side.

Solutions?

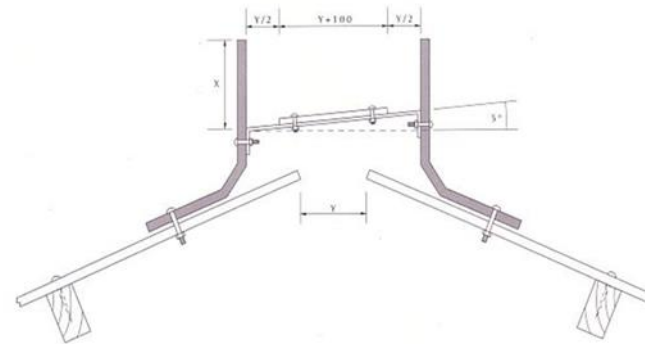
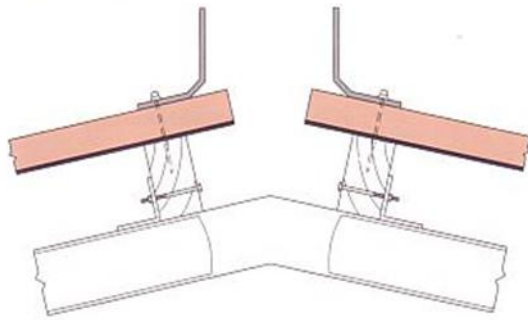


- Outlets (solution 1)
- Remove ridge caps (some not all!)
 - **COST** Hire of cherry picker (£80)
 - **PAYBACK**
140 x 210 x (1 kgx 0.05) kg LW = 1,470kg LW per 7 month housing period
 - **DOWNSIDE:** Rainfall concerns.
Annual rainfall 1008mm = 11.35tonnes/annum that could come through the open ridge in 365 days.
This is less water ingress in one year than the cattle inside the building produce in three days.

Solutions?



- Outlets (solution 2)
- Galebreaker Lightridge or similar at £110 per linear meter
 - **COST:** £4620 (based on 42m)
 - **PAYBACK:** 22 months, then increase returns by approx. £2,940p.a.



Solutions?



- Inlets
 - Ventair Sheeting
 - (Excellent for gable ends and exposed sides BUT massively restrictive)



Void area



| Material | Specification | Void area |
|--------------------------------|---------------------------|-----------|
| Ventair sheeting | | 4.5% void |
| AS24 Vented sheet | | 12% void |
| Space boarding | 6 inch board, 3/4inch gap | 11% void |
| | 6 inch board, 1 inch gap | 14% void |
| | 4 inch board, 1 inch gap | 20% void |
| Yorkshire board; | As above plus: | |
| | 6 inch board, 2 inch gap | 25% void |
| Galebreaker | Standard | 25% void |
| Highlight™ Ventilated cladding | | 25% void |

Yorkshire boarding!



Solution



- Remove fixings from the bottom of the Ventair sheeting
- Weld metal spades to the steel work so that the bottom wooden purlin can be moved higher to leave at least 200mm gap between the purlin and the top of the solid wall.
- Fix a timber batten to the top of the relocated purlin so that the Ventair sheet is pushed out at the bottom to leave a 200mm horizontal gap between the Ventair sheet and the solid wall.
- The above action will create an additional 0.2m x 42m gap along each side = +8.4m²

Cubicles



- **Big Straw shed**

Length = 140ft 42.0m

Building width = 50ft 15.24m

Building area = 640 m²

Roof height difference = 2.03 m @15 degree pitch

Stocking density = max 120 in @ 400kg; out @ 600kg LW

OUTLETS REQUIRED = 10.4m² at ridge height

OUTLETS ACTUAL = 2.75 m² at ridge height

INLETS REQUIRED per side = min 10.4 m²

INLETS ACTUAL = 4.9 m² on backside, >>>on open side

Issues



- Outlet is only 26 % of requirement
 - Restricting growth
 - Increasing respiratory risk
- Inlet is also restrictive at only 47% of requirement (one side)
- Impact of restrictive back wall should not be underestimated.
- Uncontrolled wind speeds along front of building!

Solutions



- Outlets
- Remove ridge caps (some not all!)
 - **COST** Hire of cherry picker (£80)
 - **PAYBACK**
120 x 210 x (1 kgx 0.05) kg LW = 1,260kg LW per
7 month housing period
 - **DOWNSIDE:** Rainfall concerns. Rain will fall on
cubicles...

- Outlets (solution 2)
- Galebreaker Lightridge or similar at £110 per linear meter
 - **COST:** £2310 (based on 42m)
 - **PAYBACK:** 6.5 months, then increase returns by approx. £2,520p.a.

