MONITOR FARM Scotland

SRDP Farm Advisory Service

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STRATHSPEY MONITOR FARM

VENTILATION IN STORE CATTLE COURTS

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BACKGROUND

The Strathspey Monitor Farmer, Malcolm Smith rents land and a steading at Congash Farm, just south of Grantown-on-Spey and three miles away from the home farm, Auchernack.

This winter, unvaccinated calves at Congash were hit with pneumonia and were subsequently treated. However, Malcolm and Calum (his son) saw that there was visibly reduced vitality and growth for a period, demonstrated into 2024 when weights of 1kg/day DLWG or less were recorded compared to 1.6kg average DLWG for vaccinated calves at the home farm over the same period.

Ventilation in the Congash steading is thought to be an issue, particularly evident on muggy winter days.

The Smiths were aware of the expertise in livestock ventilation of Jamie Robertson, LMS design, and invited him to Congash to assess the steading and make recommendations with the help of the Monitor Farm Management Group.

Jamie visited on a cold, misty, still day in January 2024 and spoke with members of the Monitor Farm Management Group, several of whom had previously had bouts of pneumonia in their livestock.

THE NUMBERS

The livestock are held at Congash under three roofed courts with widths 11m, 11m and 18m (35ft, 35ft and 60ft) (see the last page).

The predominant wind direction is from the SW so theoretically the building cluster is well-placed for wind driven ventilation.

The two 11m (35ft) roofs cover four rows of slatted pens, three pens per 36m (120ft) length.

Each pen is 12m (40ft) x 3.5m (11) ft.

- 6 pens hold 12 cows each (72 total) and
- 6 pens hold up to 20 calves each (120 total)

DOES THE SHED VENTILATE COMPETENTLY?

a) Rule of thumb; cattle need 0.1m^2 of outlet at the **ridge** per adult animal,

b) minimum 0.1m^2 inlet in each **sidewall**.

c) Optimum inlet (high yielding dairy cows & high growth rate beef animals) 0.2m^2 per animal in each **sidewall**.

d) 72 cows plus 120 calves averaging 200 kgs (i.e. 3 calves equivalent to 1 cow)

e) Total 112 cow equivalents need 112 x 0.1m^2 outlet = 11.2m^2 outlet

f) Therefore we need 11.2m^2 minimum inlet on each side.

CONGASH'S APPROXIMATE FIGURES

On the spot diagnosis needed nothing more than a tape measure:

Roof

a) Each roof (two of) has a full-length open ridge of approximately 150mm (6 inches) width

b) Therefore the outlet area is the building length 36.6m x 0.15 (gap width) x 2 (2 roofs) = 5.4m^2 x 2 = 10.4m^2

c) Thus using a ballpark of 0.1m2 per adult for outlet we can check any building competence for inlets and outlets in 5 minutes. Ballpark estimate for outlet was 11.2m^2; actual outlet is approximately 10.4m^2. So the outlet is not a major issue.

Sidewall

a) The sidewall on outside wall is a 2.25m (7ft) high solid wall with a 1m (4ft) spaceboard above. 150mm (6 inch) board with less than 25mm (>1 inch) gap means 10-14% of spaceboard is open area. The total spaceboard area is 36.6m x 1.0m approx, so 36.6m^2 of which 10% is open space.

b) Thus the most important sidewall in the whole build complex (because is the inlet facing the prevailing wind) is providing 3.66m^2 of inlet compared with a minimum requirement of 11.2m^2.
One third of requirement.
A massive restriction on inlet and therefore total ventilation when wind speeds are low and deadly in still air conditions

c) At this point ventilation will be driven by the healthy stack effect. The stack effect energy is the warm air rising through the open ridge that then SUCKS the equal volume of air through the various sidewall openings. Where sidewalls are restricted there will be little clean air entry and a subsequent rapid decrease in air quality inside that wall.

WHAT TO DO?

Calculate the designed inlet/outlet areas (i.e not ballpark figures). See below.

The requirement is calculated at 15m^2 in the outlet and a minimum of 15m^2 in each sidewall. The spaceboard is not suitable. Currently, the wall is 7ft high with 4ft cladding above. Options:

1. Galebreaker screen (fixed) or Yorkshire Board @ 25% void with existing wall: 36m x 1.2m x 25% = 11m^2. Yorkshire board is 25% void; two rows of 150mm (6 inch) boards and 50mm (2 inch) gaps, with gaps offset.
2. Existing spaceboard with a 430mm completely open gap below the eaves = 36.6 x 0.43m = 15m^2 opening + spaceboard gap of 3m2
3. Reduce wall height to 1.5m (5ft) and have 36.6 length x 1.83m height Yorkshire board above to give 16.7m^2 opening.
4. Keep 2.25m (7ft) high wall (because Congash is rented) and replace spaceboard with a moveable system that would give nearly 44m2 of opening above (remember **optimum** opening on each side is TWICE the calculated ridge area of 15m2).
5. Automatic curtain (VVS): £13,000 fitted = >30m^2 inlet area
6. Manual roller blinds : £5,000 + fitting = >30m^2 inlet area.

SOLUTIONS

The ballpark analysis quickly identified significant issue for this building.

The designed calculations as available in the AHDB publication allows us to progress by indicating what the ideal inlet/outlet areas should be, and then assess the practical options of providing some or all of the ideal designed vent areas.

Suggestion 2 (previous page) may be the least cost but is not available if the landlord does not allow. Some rainwater and snow ingress is inevitable. Suggestion 1 is a long-term practical solution and will give three times more inlet than the existing system but is short of design minimum.

Option 3 would require owner consent but would provide design need.

Options 4, 5 and 6 all provide what is required including protection when needed from bad weather. All these ventilation items could be removed from the tenant farm and used elsewhere with the additional cost of the VVS (automatic curtain) giving a serious benefit of removing the need for manual adjustment at a site with limited visits.

Short-term decision has been to remove every other spaceboard for the rest of this season, giving 20m^2 of inlet but accepting a modicum of rainwater ingress at times (but this is onto slats so is a decent compromise).

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THE COST OF PNEUMONIA

For 80 steers

Any change to a system should look at a cost/benefit analysis. Acute and chronic respiratory disease is a current cost with reduced DLWG for a while (if infection is cleared rapidly) or permanently if acute.

DLWG loss in 80 cattle x 50% reduction in DLWG* x 30 days @£3/kg = £3,600

Vet and med and labour (typically 40% of DLWG financial loss) = £1,400

Added feed cost to make up to sale weight = £1,560

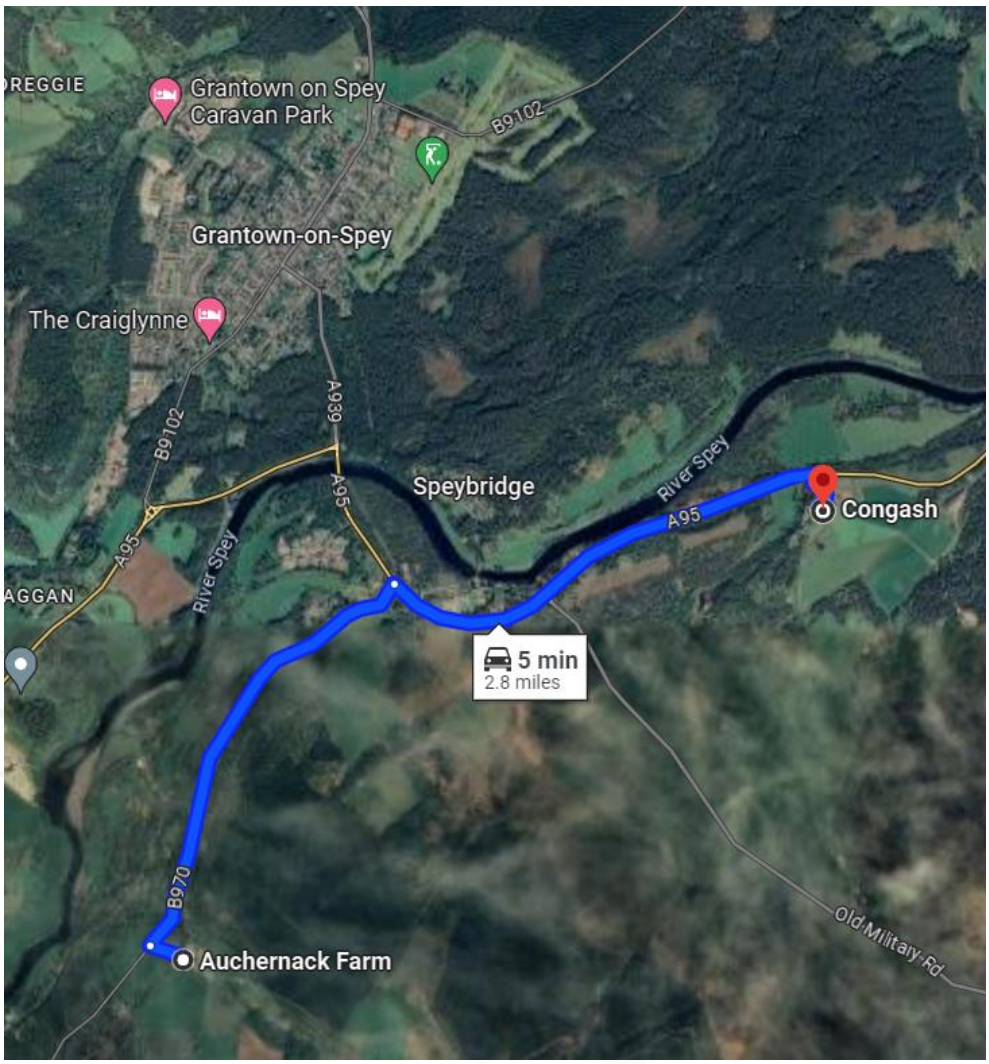
*(ie +15kg LW for 80 calves growing at a modest 1kg/d @£1.30 per day feed cost)

RECOMMENDATIONS

For any building with ventilation restrictions; do costings against a minimum 3% improvement in yield or a more typical 5% improvement, per annum.

In this case investment, which should include the cost of vaccination, would expect payback within 4 years if the most expensive option (VVS) was adopted).

Congash Steading



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