

1 **Use of welfare outcome information in three types of dairy farm inspection reports**

2 Y. Lin, S. Mullan, and D. C. J. Main

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4 **SUPPLEMENTARY MATERIAL**

5 **Supplementary Table S1.** The different categories from the three standards that relate to animal welfare which
6 were included in the analysis.

| Categories to assess within the standards | Assured Dairy Farm | Cross Compliance | Soil Association Organic Standards |
|---|----------------------------------|--|--|
| 1 | Staff and contractors | Staffing | Animal welfare |
| 2 | Animal health and welfare | Animal care | How are sick and injured animals dealt with? |
| 3 | Animal medicines and biosecurity | Keeping records | Veterinary records |
| 4 | Calf rearing | Accommodation buildings | Mastitis |
| 5 | Environmental protection | Environment | Parasites |
| 6 | Housing and shelter | Freedom of movement | Johnés/other |
| 7 | Feed and water | Feed, water and other substances | Vaccinations |
| 8 | Livestock transport | Breeding procedures | Adequate space |
| 9 | Milking - general hygiene | Equipment automatic or mechanical | Details of housing |
| 10 | Milking area-robotic | Mutilations | Calves rearing |
| 11 | Milking equipment | SMRS 13, 14, 15 (control of foot and mouth disease, certain animal diseases and bluetongue) | Calf feeding |
| 12 | Milking inspection | Inspection | Livestock management plans |
| 13 | Milking inspection-robotic | | Dirtiness - welfare spot only |
| 14 | Milking parlour | | Lameness |
| 15 | Traceability | | Skin lesions |
| 16 | Casualty and fallen stock | | Swollen hocks |
| 17 | Documents and procedures | | Thin cows |
| 18 | | | Coughing |
| 19 | | | Fertility |

| | |
|----|-------------------------------------|
| 20 | Defra welfare codes |
| 21 | Grazing records |
| 22 | Dairy parlour |
| 23 | Details of feeding |
| 24 | Calf rearing and weaning housing |
| 25 | Movement documentation |
| 26 | Mortality/rejection records |
| 27 | Stock/bird movements |
| 28 | Feet |

Supplementary Table S2. Some examples of the comments made by assurance assessors from the farm reports of the three schemes and their classification by the author.

| Ex. | | Question | Comment | Compliance status | Comment Classification |
|-----|-----|--|--|-------------------|------------------------|
| 1 | ADF | Is housing constructed to provide a safe, hygienic and comfortable environment for stock and maintained to avoid injury and distress? | Good housing. /All appear satisfactory to good. | Compliant | Resource |
| 2 | ADF | Is housing of sufficient size for the appropriate stocking density to be met? | Adequate stock numbers. Spare stalls. | Compliance | Resource |
| 3 | ADF | Do stocks receive a daily diet sufficient to maintain full health and vigour? | Cattle look well. / All stock in good condition & healthy. /All cattle appear in good condition, condition score 3 to 3.5 in cows. /Stock in good body condition, all look bright and healthy. | Compliance | Outcome |
| 4 | ADF | Is a review of the health plan, including a collation of the number of cases of lameness and mastitis and culling rate, carried out at least annually? | Annually-Mastitis-5 cases, Lameness-2 cases. 2 per year. /28 cases mastitis, 0 cases Lameness 20 % cull rate. | Compliance | Outcome |
| 5 | ADF | Are detailed medicine records for all treatments and medicines purchased and administered, including those administered by the vet, kept updated and retained for at least five years? | Insufficient information being kept for medicine usage - no meat or milk withdrawal end dates, no batch number recorded against medicine used, no mention of who administered. | Non-compliant | Outcome |

| | | | | | |
|----|-----|--|---|----------------|----------|
| 6 | ADF | Is a written health plan established, implemented and reviewed regularly according to circumstances? | BCVA plan last reviewed on 01/09/09. Herd health plan has not been reviewed with the past 12 months. | Non-compliance | Resource |
| 7 | ADF | Are cubicle systems designed to allow cattle to exhibit normal behaviour? | Super comfort cubicles. 1 | Compliance | Unclear |
| 8 | ADF | Are the welfare needs of the stock met at all times? | No welfare issues noted. 2 | Compliance | Unclear |
| 9 | CC | Are sick animals suitably cared for and where necessary getting veterinary advice? /Is accommodation for sick and injured animals suitable for purpose? | Regular visits from vets. 3 chronic lame cows in yard awaiting Owner. One lame cow to be shot left in cubicle house as unable to rise this morning but in sternal recumbence & comfortable. When seen had collapsed in passageway so I euthanized it. I confirmed that owner had been arranged as claimed & also confirmed with vet practice that this cow was up, ambulatory and giving no serious cause for concern at bTB test 2 days before so no breach. | Compliance | Outcome |
| 10 | CC | Are sick animals suitably cared for and where necessary getting veterinary advice? /Is accommodation for sick and injured animals suitable for purpose? | There was a high incidence of severely lame cows that had not been effectively treated. He has not consulted his vet or foot trimmer and has not been foot bathing as previously advised. This is an intentional breach as he has been given a lot of advice about lame cows over several visits and a prosecution for | Non-compliance | Outcome |

causing suffering by failing to treat lame cows was pending at the time of this visit.

| | | | | | |
|----|----|--|---|----------------|----------|
| 11 | SA | Details of housing | Cubicles and loose housing. Cubicles with rubber mats bedded with untreated sawdust. Straw bedding for loose housing. Slatted passageways in new building. | Compliance | Resource |
| 12 | SA | Livestock Management Plans | BCVA Health Planner initially compiled 27/06/05 and last reviewed 15/09/10. As detailed above, this plan does not detail specific treatments administered to cows with toxic mastitis or acute lameness. These elements of the plan are to be reviewed again. | Non-compliance | Outcome |
| 13 | SA | Lameness/ Swollen hocks/ coughing/ skin lesion/ thin cow | 3 out of 20. | N/A | Outcome |

¹ With the comment of ‘super comfort cubicle’, the word ‘comfort’ confused the author. The author had difficulties to learn that whether it is describing the adequate space, straw quality or mat depth in the cubicle or the cow feels comfortable inside the cubicle.

² In regard to the comment of 'no welfare issue noted', the author also had difficulties classifying it to the correct category. Animal welfare issue can be identified by either or both outcome-based and resource-based measurements. Without clearly stated in which areas the assessors were judging from, the comment could only serve as a yes or no answer to that specific question.

Supplementary Material S3. Questionnaire on objective evidence in Farm Assurance Report

This survey is part of the on-going project to study about Farm Assurance Scheme in dairy cattle. The information that you provide is essential to find out the efficiency of the reports. This questionnaire takes about 10-15 minutes to complete. Thank you for your participation.

1. Which age group are you? 20-30 30-40 40-50 50-60 Above 60

2. What is your gender? Male Female

3. How long have you been an assessor?
Less than 3 years 3-6 years 6-9 years More than 9 years

4. What was your previous occupation?

5. Which scheme(s) do you assess?

6. What objective evidence do you normally record in the comments box when assessing the following standard?

| | | |
|---|--|--|
| A | ‘Is housing of sufficient size to allow for appropriate group size and stocking densities?’ | |
| B | ‘Are cubicle systems appropriately designed to allow cattle to exhibit normal behaviour with at least 1 cubicle per cow and adequate loafing area?’ | |
| C | ‘Are all stock provided with sufficient access to feed?’ | |
| D | ‘Are the welfare needs of the stock met at all times?’ | |
| E | ‘Is a review of the health plan, including a collation of the number of cases of lameness and mastitis and culling rate, carried out at least annually?’ | |
| F | ‘Are medicines only used when necessary and according to current legislation?’ | |
| G | ‘Is there an up to date medicine record containing all of the requirements of the current standard?’ | |

7. Do you think the following evidence is outcome or resource based? (Please tick the box)

| | | | |
|--|---------------|------------|----------|
| | Outcome-based | Resource - | Not sure |
|--|---------------|------------|----------|

| | evidence | based evidence |
|--|----------|----------------|
| Medical record kept in the computer | | |
| Very few mastitis/lameness cases last year | | |
| Clean straw bed | | |
| Adequate feed | | |
| Good body condition | | |
| Suitable cubicle size | | |
| Comprehensive and up to date health plan | | |
| No humane culling since last inspection | | |
| Good handling facilities | | |
| Good welfare noted | | |
| Straw bedded lying area | | |

8. We looked at 111 animal health or welfare related questions on 30 ADF reports, 2386 out of 3330 (71.7%) questions included objective evidence comments, 2306 (96.6%) of these were resource-based comments, 64 (2.7%) were outcome-based and 16 (0.7%) were the combination of two.

| | | | | | |
|---|---|--|--|--------------------------------------|--------------------------------------|
| A | Do you think this level of outcome-based evidence is: (Please tick the box) | Too little <input type="checkbox"/> | Just right <input type="checkbox"/> | Too much <input type="checkbox"/> | Not sure <input type="checkbox"/> |
| B | Please explain why you think the result is too little/ just right/too much. Are there any difficulties for assessing outcomes? | | | | |
| C | If you think there should be a change in the use of outcome-based objective evidence within the ADF reports please comment on how this could be achieved. | | | | |

Supplementary Table S4. A summary table of comment definitions from the authors and most of the assessors.

| Example comments | Author's definition | Most assessors' definition |
|--|---------------------|----------------------------|
| Good welfare noted | Unclassified | Animal-based |
| Good body condition | Animal-based | Animal-based |
| Clean straw bed | Resource-based | Animal-based |
| Suitable cubicle size | Resource-based | Animal-based |
| Adequate feed | Resource-based | Animal-based |
| Very few mastitis/lameness cases last year | Animal-based | Animal-based |
| Straw bedded lying area | Resource-based | Resource-based |
| Good Handling facilities | Resource-based | Resource-based |
| No humane culling since last inspection | Animal-based | Resource-based |
| Medical record kept in the computer | Resource-based | Resource-based |
| Comprehensive and up to date health plan | Resource-based | Resource-based |