

This is an Open Access document downloaded from ORCA, Cardiff University's institutional repository: <https://orca.cardiff.ac.uk/id/eprint/101727/>

This is the author's version of a work that was submitted to / accepted for publication.

Citation for final published version:

Miele, Mara , Lomellini-Dereclenne, A.C., Mounier, L and Veissier, I 2017. Implementation of the European legislation to protect farm animals: a case-study on French inspections to find solutions to improve compliance. *Animal Welfare Journal* 26 (3) , pp. 311-321. 10.7120/09627286.26.3.311

Publishers page: <https://doi.org/10.7120/09627286.26.3.311>

Please note:

Changes made as a result of publishing processes such as copy-editing, formatting and page numbers may not be reflected in this version. For the definitive version of this publication, please refer to the published source. You are advised to consult the publisher's version if you wish to cite this paper.

This version is being made available in accordance with publisher policies. See <http://orca.cf.ac.uk/policies.html> for usage policies. Copyright and moral rights for publications made available in ORCA are retained by the copyright holders.



# Online Research @ Cardiff

This is an Open Access document downloaded from ORCA, Cardiff University's institutional repository: <http://orca.cf.ac.uk/103287/>

This is the author's version of a work that was submitted to / accepted for publication.

Citation for final published version:

Miele, Mara, Lomellini-Dereclenne, A., Mounier, L. and Veisser, I. 2017. Implementation of the European legislation to protect farm animals: a case study on French inspections to find solutions to improve compliance. Animal Welfare Item availability restricted. file

Publishers page:

Please note:

Changes made as a result of publishing processes such as copy-editing, formatting and page numbers may not be reflected in this version. For the definitive version of this publication, please refer to the published source. You are advised to consult the publisher's version if you wish to cite this paper.

This version is being made available in accordance with publisher policies. See <http://orca.cf.ac.uk/policies.html> for usage policies. Copyright and moral rights for publications made available in ORCA are retained by the copyright holders.



1 **Implementation of the European legislation to protect farm animals: a case-study on**  
2 **French inspections to find solutions to improve compliance**

3

4 AC Lomellini-Dereclenne\*†, M Miele‡, L Mounier†, I Veissier†

5

6 †UMR1213 Herbivores, INRA, VetAgro Sup, Clermont Université, Université de Lyon, F-  
7 63122 Saint-Genes-Champanelle, France

8 ‡Cardiff School of Planning and Geography, Cardiff University, Cardiff CF10 3WA, United  
9 Kingdom

10 \* Contact for correspondence and requests for reprints:

11 [anne-claire.lomellini-dereclenne@vetagro-sup.fr](mailto:anne-claire.lomellini-dereclenne@vetagro-sup.fr)

12

13

14 **Abstract**

15 In the European Union at least 1% farms from are inspected every year and sanctions are applied  
16 to farms that do not comply with the legislation on animal welfare. These on-farm inspections  
17 can result in measures to correct welfare problems detected on farms. They can also highlight  
18 major risks that will require a focus of efforts and help prevent further non-compliances. Here  
19 we analysed the reports from inspections of French cattle farms between 2010 and 2013 to  
20 check whether inspection stimulates improvement and to propose ways to improve how animal  
21 welfare legislation is implemented through the cross-compliance system. French inspectors use  
22 32 items to assess overall compliance of farms inspected. We found that compliance improves  
23 on farms that are re-inspected but not in other farms (8% of severely non-compliant farms).  
24 Nine items do not influence the overall assessment whereas eight items have a huge impact.  
25 The importance attributed to items varies from the 1<sup>st</sup> to the 2<sup>nd</sup> visit of a farm. The major risks  
26 are absence of farm records, lack of basic care (practices or enclosures likely to harm animals,  
27 insufficient feeding) and inadequate skills (no vet consulted, insufficient qualified staff). To  
28 improve compliance with EU animal welfare legislation and the efficiency of the inspection  
29 system, we suggest organising consultation between inspectors, ministry central services and  
30 welfare experts to (i) refine the checklist and harmonise interpretations of item compliance; (ii)  
31 make sure all farmers are aware of the legislative requirements and the major risks of non-  
32 compliance; and (iii) define plans for a stepwise improvement of non-compliant farms.

33 **Keywords:** animal welfare, cattle, compliance, EU legislation, inspections, overall assessment

34

## 35 **Introduction**

36 Remote risk of undernutrition, modification of the human–animal relationship, urbanization,  
37 intensification of farming conditions, progress in animal welfare science, and environmental  
38 degradation have made the use of farmed animals and ethical farming practices a focal issue  
39 (Broom 1991; Miele *et al* 2011; Baratay 2012). These concerns emerged in the 1960s in the EU,  
40 where they remain prominent in European Commission Eurobarometers organised in 2005,  
41 2007, 2015 (European Commission 2005, 2007, 2016), and are now seen as a worldwide issue  
42 (Kjærnes, Miele & Roex 2007; Bayvel *et al* 2012; You *et al* 2014).

43 The EU has addressed mounting citizen concern over the protection of farmed animals by  
44 lending increasing importance to animal welfare in primary law, moving it from a Protocol  
45 annexed to the Treaty of the Functioning of European Union (TFUE) to a specific article  
46 (Article 13) of the Treaty of Lisbon which entered into force in 2009. Article 13 clearly  
47 recognises animals as sentient beings. Numerous pieces of legislation (secondary law) have  
48 been adopted to regulate the practices concerning farm animals. In accordance with Council of  
49 Europe conventions and recommendations, EU Member States have adopted European  
50 directives and regulations on the protection of animals on farms in transport and at slaughter.  
51 In addition, the European Commission adopted two strategies on animal welfare, one covering  
52 the period 2006–2010 and the second covering 2012–2015, in which it stresses a policy to  
53 pursue efforts to stimulate improvements in animal welfare across Europe.

54 Despite this legislative arsenal from the European Union, the welfare of farm animals seems  
55 far from fully assured. Various media scandals initiated by non-governmental organisations  
56 specialised in animal protection have challenged public opinion on the effectiveness of the  
57 animal protection laws. Indeed, according to 2016 Eurobarometer figures, 82% of the 27,672  
58 respondents believed that the welfare of farmed animals should be better protected than it is

59 today (European Commission 2016). The European Commission's effectiveness in putting  
60 Article 13 into practice is also under challenge from the European Parliament, which in 2015  
61 adopted a resolution (i.e. a motion voted by all European parliamentarians) urging the European  
62 Commission to fully implement Article 13 and adopt a new strategy on animal welfare  
63 (European Parliament 2015). In its communication on the 2012–2015 strategy for animal  
64 welfare, the European Commission recognises that practical implementation of the legislation  
65 is not entirely satisfactory and that further legislation is useless without first properly enforcing  
66 the legislation already in place (European Commission 2012).

67 Since 2007, European farms are subject to cross-compliance on animal welfare (Kuhn G *et al*  
68 2008). Member States are to inspect at least 1% of their farms, and any farmers who do not  
69 comply with minimum European requirements for animal welfare are to be sanctioned. Each  
70 year, Member States report to the Commission on the results of these inspections. This cross-  
71 compliance process can help improve the compliance of Member states in two ways. First,  
72 inspections serve to detect offences—on farms that are inspected—and can result in measures  
73 to correct these offences on the offender farms. Second, compliance monitoring can highlight  
74 major problems (in terms of seriousness and probability of occurrence in a population) that  
75 require a focus of efforts (raising awareness, proposing remedial solutions...) which, in turn,  
76 helps prevent non-compliance (Nitsch & Osterburg 2007).

77 Inspectors from the Food and Veterinary Office (FVO, an Office of the European Commission)  
78 monitor how Member States are implementing EU food policy. There are large variations in  
79 levels of farm compliance between EU Member States: on the broiler chickens directive for  
80 example, only 30% farms in France are compliant against 87% in Germany and 100% in  
81 Sweden, while on the directive concerning the protection of pigs, compliance rates range from  
82 68% in the Netherlands and 70% in France to 95% in Sweden and 100% in Poland and Slovakia.  
83 The EUWelNet project comparing results from 11 Member States (France, Sweden, UK,

84 Germany, Netherlands, Italy, Spain, Romania, Slovakia and Poland) concluded that France  
85 scores poorly on compliance with EU legislation to protect farm animals compared to the other  
86 EU countries (Bock *et al* 2014).

87 Here we set out to understand the difficulties with effective implementation of EU legislation  
88 to protect farm animals. We carried out a case study in France as it has apparent difficulties in  
89 reaching high levels of compliance. We analysed the reports from inspections of cattle farms.  
90 These inspections cover only cattle **over 6 months of age**. There is **no specific national or**  
91 **European legislation for the protection of these animals**, therefore the inspections are carried  
92 out under EC Directive 98/58 (European Commission 1998), which lays down general  
93 principles related to the care of animals - whatever the species - stating that animals should  
94 receive adequate quality and quantity of water and feed, be housed in appropriate settings,  
95 receive due care, etc. As it does not set exact requirements (e.g. no precise quality or quantity  
96 of feed or minimum space allowance per animal is specified), the directive leaves Member  
97 States wide scope for interpretation. The checklist provided to inspectors to assess the  
98 compliance of cattle farms in France uses similar general principles, thus also leaving inspectors  
99 wide scope for interpretation. This wide scope for interpretation allowed us to investigate how  
100 inspectors form a general judgement of the compliance of a farm. The specific objectives of  
101 this study are 1) to check whether actual on-farm inspections are likely to stimulate  
102 improvements in farm compliance with EU legislation to protect animals, and 2) to propose  
103 ways to enable more efficient implementation of animal welfare legislation through the cross-  
104 compliance system.

105

## 106 **Material and Methods**

### 107 *Animal welfare controls in France*

108 In France, the controls for the protection of farm animals are supervised by the Ministry of  
109 Agriculture (MoA). Each year, at least 1% farms are inspected. With a population of 223000  
110 cattle farms and 15.4 million cattle (excluding calves) on average per year between 2010 and  
111 2013, these 1% represent 2230 farms and 15400 animals inspected each year (source: MoA,  
112 <http://agreste.agriculture.gouv.fr/> and Interbev, <http://www.interbev.fr>). The inspectors are  
113 veterinarians or assistants from the local authority representing the MoA. The farms to be visited are  
114 chosen following a risk analysis, taking into account, for example, the results of previous animal welfare  
115 or health inspections, the size of the farm (large farms are more likely to be visited), the fact that a  
116 farm has been recently operating or large changes have been noticed (enlargement of the farm, new  
117 production), problems signalled by vets or complaints from citizens. The sample of farms to be  
118 inspected is completed by farms chosen at random to achieve 1% in each department. MoA central  
119 services have developed checklists to be used on-farm and guidelines to help inspectors use these  
120 checklists (some can be found at <http://agriculture.gouv.fr/les-vade-mecum-dinspection>). The  
121 checklist and guidelines are species-specific. The checklist related to inspections on animal welfare in  
122 the bovine sector was elaborated from EC Directive 98/58 on the protection of animals kept for farming  
123 purposes, as there is no specific legislation for the welfare of cattle. The checklist includes 32 items  
124 covering 6 areas: housing, equipment, staff, management, resources, and documentation (Table 1).

125 On a given farm, each of the 32 items are to be checked and the results are to be expressed as  
126 compliant, not compliant, not relevant, or not observed (if a specific problem means the item  
127 cannot be assessed). The guidelines give indications on how to assess the items and on what  
128 makes compliance or non-compliance for each item (e.g. when a farm is to be considered non-  
129 compliant for inappropriate housing, insufficient lighting, under-qualified staff, etc.). The  
130 guidelines also state cases where items will always be not relevant or always be compliant.  
131 Lighting cycle and intensity is only assessed when artificial lighting is used (implying that it is  
132 not relevant in the case of natural lighting). It is considered that cattle do not have predators and



133 so cattle farms will always be compliant with the item ‘protection against adverse weather and  
134 predators when outdoors’. Farms are considered compliant on the item ‘farming practices  
135 avoiding severe or lasting pain or harm’ pending the determination of harmful practices and  
136 their assessment by scientific experts. Furthermore, only painful mutilations (female castration  
137 or dehorning) or administration of unsecure drugs at the time of the visit can lead to a non-  
138 compliance with these two items, so the vast majority of farms are expected to be compliant.

139 After having checked all items, the inspector issues an overall assessment of the farm, which is  
140 rated ‘fully compliant’, ‘slightly non-compliant’, ‘moderately non-compliant’, or ‘severely  
141 non-compliant’. The guidelines do not specify how the conclusion shall be drawn from the  
142 evaluation of the 32 items, leaving it up to the inspector to judge the overall compliance of a  
143 farm.

144 In most cases, farms that are rated severely non-compliant get visited a second time, unless they  
145 get shut down soon after the first visit, in which case they cannot be re-visited.

146 After each inspection, the inspectors send a report of the farm’s results (the 32 items and the  
147 overall assessment) back to the MoA, which collects all such reports in a central database. For  
148 the purposes of this study, the French MoA granted INRA access to the database.

#### 149 *Data collection and analyses*

150 We collated a total of 11 487 reports from inspections of French cattle farms between 2010 and  
151 2013 and after discarding 141 reports where at least one item was not observed, a final total of  
152 11 346 reports were analysed, corresponding to 9327 different farms visited once and 1155  
153 farms re-visited twice or more.

154 All statistical analyses were performed using R software (R core team 2016). In order to avoid  
155 dependencies between variables, we analysed all reports from first visits of farms (regardless

156 of whether farms would be visited only once or subsequently re-visited) and separately analysed  
157 all the reports from farms that were visited twice.

158 A  $\chi^2$  test was used to analyse the distribution of the overall assessment among farms visited  
159 once and its change over years. A  $\chi^2$  test was also used to analyse the distribution of non-  
160 compliances at item level in order to identify those items on which farms were more often non-  
161 compliant. For farms visited twice, a McNemar  $\chi^2$  test was used to compare the distribution of  
162 the overall assessment between the first and the second visit.

163 On first visits, a logistic regression was run to analyse the links between overall assessment and  
164 number of non-compliant items or non-compliances noted on specific items. To simplify the  
165 analyses, farms were classified as severely non-compliant vs. not severely non-compliant  
166 ('fully compliant', 'slightly non-compliant', and 'moderately non-compliant'). In a first  
167 analysis, the explanatory variable was the number of items with which the farm is not  
168 compliant. A second analysis used 32 explanatory variables corresponding to the level of  
169 compliance of the farm for each item; again, to simplify the analysis, per-item level of  
170 compliance was expressed as non-compliant vs. different to non-compliant (compliant or not  
171 relevant). The odds ratio (**OR**) obtained for an item measures the risk of a farm being declared  
172 severely non-compliant if it fails to comply with that item—in other words, the importance that  
173 inspectors lend to that item. Then, to highlight major instances of non-compliance, we  
174 multiplied the OR obtained for an item by the percentage of farms that were non-compliant on  
175 that item.

176 To analyse whether inspectors lend the same importance to an item in case of repeated visits, a  
177 similar logistic regression analysis was run separately on the first and the second visits. All  
178 items with a significant impact on the first or second visit were kept in the analysis.

179

## 180 **Results**

### 181 *Overall assessment: changes over years and visits*

182 At first visit, 60.6% of the farms were found fully compliant, 17.0% slightly non-compliant,  
183 14.5% moderately non-compliant, and 7.91% severely non-compliant. These proportions did  
184 not change over years from 2010 to 2013 ( $\chi^2 = 0.63, P > 0.05$ ) (Figure 1).

185 When farms were visited twice, there were observable improvements from first to second visit:  
186 4.8% fewer farms were found severely non-compliant on the second visit compared to the first  
187 one. To estimate the size of the improvement, the four classes ('fully compliant', 'slightly non-  
188 compliant', 'moderately non-compliant', or 'severely non-compliant') were transformed into  
189 numbers (4, 3, 2, 1). A 0.23 improvement was observed from first to second visit (Mc Nemar's  
190  $\chi^2 = 56.4, P < 0.001$ ), suggesting that a farm had a 23% chance of reaching the next best category  
191 on the second visit (Figure 1).

### 192 *Assessment at item level*

193 On the first visits, most items were fulfilled: 19 items were fulfilled on 80% of the farms and  
194 11 items were fulfilled on 50 to 79% of the farms.

195 The non-compliances were not evenly distributed among items ( $\chi^2 = 143,000, P < 0.001$ ) (Table  
196 1). The items farms most often failed to comply with were: 'Farm records compliant with  
197 legislation' (24.2% of farms), 'Protection against adverse weather and predators when  
198 outdoors' (10.5% of farms), 'Equipment and building materials easy to clean and disinfect'  
199 (7.66% of farms), 'Quantity and quality of feeding' (6.09% of farms), 'Quantity, quality and  
200 frequency of watering' (5.9% of farms), 'Farming practices avoiding severe or long-lasting pain  
201 or harm' (5.6% of farms), 'Feeding and watering devices designed to avoid contamination'  
202 (5.4% of farms).

203 Some items were often considered not relevant, including the two items related to artificial  
204 ventilation ('Functioning of ventilation devices' and 'Functioning of the back-up ventilation  
205 system', not relevant in more than 95% of farms) and artificial lighting ('Intensity and cycle of  
206 lighting', 40% of farms).

### 207 ***Transition from checklisted items to overall assessment***

#### 208 *Influence of number of item-level non-compliances on overall assessment*

209 The number of items that a farm does not comply with had a significant impact on the overall  
210 assessment (logistic regression, OR = 1.81,  $P < 0.001$ ). Half of farms that did not comply with  
211 7 or more items were declared severely non-compliant, and farms counting more than 20 item-  
212 level non-compliances were (nearly) always considered severely non-compliant (Figure 2).  
213 However, there were variations around this general trend: for instance, one farm that failed to  
214 comply with 18 items was nevertheless considered fully compliant and one farm that failed to  
215 comply with 30 items was considered only moderately non-compliant (rather than severely non-  
216 compliant), whereas 86 farms that failed to comply with just one, 53 farms with only two or 54  
217 farms with only three items were considered severely non-compliant (in most cases, these farms  
218 failed to comply with the 'Farm records compliant with legislation' item).

#### 219 *Items associated with overall assessment as 'severely non-compliant' (on 1<sup>st</sup> visit)*

220 There were between-item variations in the impact of a non-compliance on a farm's overall  
221 assessment (logistic regression on first visits, Table 2). On first visits, 9 items had no impact on  
222 overall assessment: 'Protection against adverse weather and predators when outdoors',  
223 'Equipment and building materials easy to clean and disinfect', 'Quality of ambient air (gases  
224 and dust)', 'Functioning of ventilation devices (if artificial ventilation is used)', 'Functioning  
225 of the back-up ventilation system and system alarms (if artificial ventilation is used)', 'Adequate  
226 staff numbers', 'Frequency of inspections of the animals', 'No mutilation (female castration or

227 dehorning after 4 weeks of age without anaesthesia),’ If in use, tethering systems allowing  
228 basic behaviours’.

229 The items most often associated with an overall assessment as ‘severely non-compliant’ were:  
230 ‘Farm records compliant with legislation’, ‘Consultation of a veterinarian when needed’,  
231 ‘Knowledges and qualifications [of staff]’, ‘Farming practices avoiding severe or long lasting  
232 pain or harm’, ‘Outside enclosures well delimited’, ‘Frequency of feeding’, ‘Quantity and  
233 quality of feeding’, and ‘Intensity and cycle of daily lighting (if artificial lighting is used)’. The  
234 OR of these items was above 2, meaning that a farm that registers non-compliance on each of  
235 these items is twice as likely to be found severely non-compliant than farms that comply with  
236 these items.

#### 237 *Changes in the importance of items when a farm is visited twice*

238 On farms visited twice, 13 items had a significant impact on the overall assessment on the first  
239 or the second visit and were kept in the logistic regression. Their impact was not necessarily  
240 the same on the two visits (Table 3).

241 The OR of four items increased from first to second visit: ‘Feeding and watering devices  
242 designed to avoiding contamination’ (the OR increased by 273% at second visit compared to  
243 first visit), ‘Knowledge and qualifications’ (+172%), ‘Outside enclosures clear of harmful  
244 objects such as metal or plastic scraps or disused machines’ (+29 %), ‘Quantity and quality of  
245 feeding’ (+ 26%).

246 The OR of four other items decreased from first to second visit: ‘Safety of drugs administered  
247 to animals (excluding prescriptions by a vet)’ (-89%), ‘Adequate functioning of feeding and  
248 watering devices’ (-56%), ‘Prompt treatment of ill or injured animals’ (- 49%), and  
249 ‘Consultation of a veterinarian when needed’ (-39%).

#### 250 *Identification of major risks*

251 The most critical risk by far was ‘Farm records compliant with legislation’ (OR of this item at  
252 first visit multiplied by percentage of farms that do not comply with this item = risk of 101).  
253 Then, the items ‘Farming practices avoiding severe or long lasting pain or harm’, ‘Consultation  
254 of a veterinarian when needed’, ‘Quantity and quality of feeding’, ‘Outside enclosures clear of  
255 harmful objects such as metal or plastic scraps or disused machines’, ‘Knowledge and  
256 qualifications’, ‘Quantity, quality and frequency of watering’ were associated to a risk between  
257 10 and 20 (where 20 can correspond to an OR of 2 and 10% farms not complying).

258

## 259 **Discussion**

260 Our analysis of reports from official inspections of French farms between 2010 and 2013 found  
261 that a majority of farms were declared compliant with EU legislation to protect animals and that  
262 the proportion of fully-compliant farms increased when farms were re-inspected. This analysis  
263 also enabled us to gain insight on how inspectors concluded on whether a farm is or is not  
264 compliant, and to propose ways to make the inspection process more effective in terms of  
265 improving the level of compliance across farms.

266 First of all, this analysis of inspections performed in French cattle farms showed that 60.6% of  
267 farms were declared fully legislation-compliant when visited the first time, suggesting that these  
268 farms meet the basic standards for the welfare of their animals. In contrast, 7.9% of the farms  
269 were found severely non-compliant on first visit. In the bovine sector, the level of compliance  
270 is lower in France than in other EU Member States such as the UK (more than 80% of farms  
271 were fully compliant in 2004), Denmark (77% of farms fully compliant in 2010), and Finland  
272 (72% of farms fully compliant in 2013) (DEFRA 2005; Danish Center for Animal Welfare  
273 2010; Finnish Center for Animal Welfare 2013). Our results corroborate previous findings from  
274 the EUWelNet project (see introduction) that France has apparent difficulties implementing

275 European legislation to protect animal welfare. The poorer results obtained by France might come  
276 from the fact that the farms to be inspected are essentially chosen from a risk analysis and this may not  
277 be the case in all countries.

278 When the farms were re-inspected, compliance improved: severe non-compliances were still  
279 found but at a lower frequency, while the proportion of fully-compliant farms increased. This  
280 improvement may result from a general trend in the farms population, due for instance to  
281 farmers being more concerned by the welfare of their animals or to wider societal pressure, or  
282 changes in farming models (Barkema *et al* 2015). However, no improvement was observed  
283 from 2010 to 2013 on farms visited once. Therefore, inspections *per se* are likely to have  
284 positive effect on the level of animal protection on French cattle farms. Inspections are liable  
285 to make farmers more aware of requirements in terms of animal protection. However, only 1%  
286 farms get inspected each year, and on average there was only a 23% chance that a farm would  
287 improve its compliance between two inspections. Therefore inspections-driven improvement  
288 remains very slow at population level. As suggested by Anneberg *et al* (2013), efforts to raise  
289 awareness of all farmers on legislative requirements could stimulate improvements more  
290 quickly than only inspecting farms.

291 Even though the French MoA provides precise guidelines on how to inspect farms, it seems  
292 that inspectors do not strictly follow them. For instance, the guidelines specify that ‘Protection  
293 against adverse weather and predators when outdoors’ is to be considered not relevant on all  
294 cattle farms, yet inspectors considered this item as compliant on 79% of farms and as not  
295 relevant in only 19% of farms. Likewise, the guidelines stipulate that farms shall always be  
296 found compliant in relation to ‘Farming practices avoiding severe or long lasting pain or harm’  
297 (due to a lack of scientific evidence), yet 5% of farms were declared non-compliant on this  
298 item. The inspectors seem to use - at least to a degree - their own way to interpret what they see  
299 on farms before considering whether or not an item is fulfilled. This may be seen as a risk that

300 farm inspections may not be performed evenly between inspectors, as some inspectors may  
301 follow the guidelines more strictly than others, but it could also be seen as a sign that inspectors  
302 endorse the inspection process.

303 Based on Lipsky's theory of street-level bureaucracy (1980), the apparent discrepancy between  
304 the rule and what is done in practice seems inevitable, as inspectors have to confront and deal  
305 with the real-world cases of the farms they inspect. This is further emphasised by the fact that  
306 the guidelines provided by the MoA do not make it clear how to form an assessment of the  
307 overall compliance of a farm from the results obtained at item level. According to the reports  
308 collated in the French national database, the more items a farm is found non-compliant with,  
309 the more likely an inspector will judge it severely non-compliant. However, this seemingly  
310 straightforward rule does have exceptions: some farms non-compliant on many items  
311 nevertheless get declared fully compliant overall. Hence not only the quantity but also the  
312 nature of the items for which a farm is non-compliant seems to play a role.

313 Out of the 32 items of the inspection checklist, 9 appear to not influence the assessment of the  
314 overall compliance of a farm. Three concern the barn ventilation ('Quality of ambient air (gases  
315 and dust)', 'Functioning of ventilation devices (if artificial ventilation is used)', 'Functioning  
316 of the back-up ventilation system and system alarms (if artificial ventilation is used)'). Most  
317 French cattle barns use natural air circulation via specific openings in the roof and walls, which  
318 negates the need for mechanical ventilation and means inspectors can consider indoor air  
319 quality as appropriate (even when high gas and dust concentrations are found in some farms).  
320 'Protection against adverse weather or predators when animals are outdoors' also had no effect  
321 on overall assessment, although 2.3% of the farms were non-compliant on this item. Inspectors  
322 may consider that cattle can cope with such conditions without suffering. Similarly, inspectors  
323 appear not to use 'Adequate staff numbers' and 'Frequency of inspections of the animals' (both  
324 of which were noted in 2% of farms), 'If in use, tethering systems allowing basic behaviours'



325 (noted in 3% of farms), and ‘Equipment and building materials easy to clean and disinfect’  
326 (noted in 7.67% of farms) when formulating their overall assessment. These items probably  
327 need to be re-discussed between inspectors, MoA central services, and experts in animal welfare  
328 in order to either refine their descriptions, define the importance inspectors are expected to  
329 attribute to a non-compliance in these areas, or even remove them if they are found to be  
330 irrelevant.

331 In contrast, some items have a huge impact on the assessment of the overall compliance of a  
332 farm. At first visits, the presence of farm records had the largest impact on inspectors’  
333 assessment of overall compliance, as farms that do not keep records have about four times more  
334 chance of being declared severely non-compliant overall. Farm records are written accounts of  
335 mortality, occurrence of diseases, frequency of veterinarian visits, and all medical treatments  
336 administered to animals. They were absent on nearly a quarter of the farms at first visit. Some  
337 farmers seem to disregard such paperwork, considering that it does not correspond to the normal  
338 work of the farmer which is more about caring for their animals than writing out accounts of  
339 what happens (Buller & Roe 2014; Escobar & Demeritt 2016). The readiness of the farmer to  
340 consult a veterinarian when needed and the farmer’s own qualifications also have a big impact,  
341 again multiplying roughly fourfold the chances of the farm being declared severely non-  
342 compliant if they are not fulfilled. These two items relate to the skills necessary to taking good  
343 care of animals. Their impact on the overall assessment of compliance is in accordance with  
344 the importance attributed by both the EC and the French MoA to appropriate training (European  
345 Commission 2012; French Ministry of Agriculture 2016). Several items at least doubled the  
346 chances of a farm being declared severely non-compliant overall, and are related to the actual  
347 care that farmers provide their animals: practices avoiding pain or harm, outside enclosures  
348 clear of harmful objects, quantity, quality and frequency of feeding; and lighting of the barn.  
349 Other items were also found to negatively impact the overall assessment of the farm, albeit to

350 a lesser extent, and are related to farm equipment (equipment or building materials that might  
351 be harmful, feeding and watering devices, daily check of equipment) or to the detection and  
352 care of ill or injured animals. There thus seems to be a gradient in the conditions perceived by  
353 inspectors as necessary to comply with the animal welfare legislation: from taking adequate  
354 account of what is done on-farm (most importance attributed), to having the adequate skills to  
355 protect animals, covering animals' basic requirements, and finally (least importance attributed  
356 but still significant) limiting risks and providing adequate care to animals in poor health.

357 Surprisingly, some farms were declared severely non-compliant even though they failed to meet  
358 very few items of the checklist. Inspectors therefore likely used other criteria in addition to  
359 those of the checklist provided to them, at least on some farms.

360 The EFSA Panel on Animal Health and Welfare (AHAW) proposed to estimate the risks  
361 associated to a welfare problem by considering the consequence of the problem together with  
362 the exposure to the problem, i.e. probability to be affected (EFSA 2012). We transposed this  
363 reasoning by multiplying the OR linked to a farm's non-compliance with a given item  
364 (consequence of a non-compliance) by the proportion of farms that do not comply (exposure  
365 assessment). The absence of farm records was both the most important item for inspectors and  
366 the most frequent case of non-compliance, and is thus logically by far the highest risk. The next  
367 highest risks correspond to items related to the care provided to animals by the farmer ('Farming  
368 practices avoiding severe or long-lasting pain or harm', 'Consultation of a veterinarian when  
369 needed', 'quantity and quality of feeding / watering', 'Outside enclosures clear of harmful  
370 objects [...]') and the skills of the farmer ('Knowledge and qualifications'). We propose that  
371 inspection visits should lend special focus to these items to make the inspection process more  
372 efficient. In addition, all farmers could be made aware of these risks of non-compliance  
373 beforehand to ensure improvements across years on all farms, regardless of whether or not  
374 farms are singled out for inspection.

375 The results presented above suggest that the inspection process would benefit from exchanges  
376 between field inspectors, the ministry in charge of the inspections, and experts in animal welfare  
377 in order to (i) refine the inspection checklist by removing less-relevant items and focusing  
378 attention on those items that are considered especially relevant to on-farm animal protection  
379 checks, and possibly adding new items, and (ii) editing the guidelines to include  
380 recommendations on how formulate the assessment of overall compliance of a farm. During  
381 the EUWelNet project, workshops and a web forum were organised to enable technical  
382 personnel from the competent authorities of several Member States to exchange practices in  
383 checking the compliance of farms with the EU directive to protect broilers (Manteca *et al* 2013).  
384 The feedback from the staff that participated in this initiative was that it helped them identify  
385 the best ways to check the directive-related requirements. Such exchanges should at least be  
386 organised intra-Member State to help inspectors in their daily work.

387 Our analysis found that when farms were re-visited, the importance attributed by inspectors to  
388 individual items changed from first to second visit. Some items that were important at first visit  
389 became even more important at second visit. ‘Quantity and quality of feeding’ which already  
390 had a large impact at first visit, was found to have even more impact on the overall assessment  
391 of farm compliance at second visit. Indeed, supplying feed is one of the basics of livestock  
392 farming and obviously essential to animals’ lives. The farmer’s ‘Knowledge and qualifications’  
393 was also found to have more impact at second visit. Farmers have the possibility to follow free  
394 training sessions delivered by professional farmers’ organisations, and the inspectors may  
395 consider that a farmer that fails to follow a training session despite receiving a warning after  
396 the inspection is a sign that this farmer is not willing to improve the situation. The ‘Feeding and  
397 watering devices designed to avoid contamination’ item, which had little impact at first visit,  
398 had a strong impact at second visit. Again, inspectors may consider that the farmer could have  
399 easily improved the standard of cleanliness of their feeding and watering devices at no

400 additional cost. It therefore seems that at the second visit, inspectors lend more importance to  
401 the feeding of the animals—an essential part of the care given by farmers to animals—and to  
402 changes that farmers could have easily made after the first visit, i.e. his/her willingness to  
403 improve the situation.

404 In contrast, some items were given less importance by inspectors at second visit, i.e. ‘Safety of  
405 drugs administered to animals (excluding prescriptions by a vet)’, ‘Consultation of a  
406 veterinarian when needed’, and ‘Adequate functioning of the feeding and watering devices’.  
407 The first two items do not relate to the everyday care that should be given to animals, while the  
408 third may be inherent to the design of the building equipment and therefore difficult for farmers  
409 to change in the time from first to second visit, which might explain why inspectors judge them  
410 less crucial. However, inspectors would have to be interviewed to learn precisely how they  
411 interpret these items.

412 The fact that inspectors change their way of reasoning from first to second visit of a farm  
413 prompts us to posit that a way to increase the efficiency of the inspection process in terms of  
414 improving farm compliance would be to issue farms declared severely non-compliant with a  
415 progress plan. The first step could be to better educate farmers (training) to help assure the basic  
416 needs of animals (feed and water) and correct what can be easily corrected (e.g. clean devices).  
417 Then, expectations could be progressively levered to bring farms up to full compliance. This  
418 kind of stepwise approach has already been recommended to improve the levels of farmed  
419 animal health and welfare (Webster 2009; Tremetsberger & Winckler 2015). Indeed, effective  
420 progresses can be made by setting realistic objectives and regularly checking progress, then  
421 adjusting the plan according to results until reaching the ultimate goal of full compliance. In  
422 addition to controlling farm compliance, a facilitating process could be put in place to  
423 encourage farm improvement. The process could involve explaining the benefits of improving

424 the situation, helping farmers to analyse their situation, or stimulating exchanges between  
425 farmers to analyse problems and propose solutions (Whay & Main 2015).

426 In conclusion, this study shows that the results of national inspections for the protection of farm  
427 animals can be used to help Member States improve compliance to European legislation. More  
428 specifically, we suggest taking steps to:

- 429 - make farmers aware of the requirements of the regulations and the major risks of non-  
430 compliance. In the case of French cattle farms, these risks are: absence of farm  
431 records, lack of basic care of animals (farming practices or untidy enclosures likely to  
432 cause harm or pain, insufficient feeding), and inadequate skills (no vet consulted,  
433 under-qualified staff).
- 434 - organise exchanges between ministry central services, field inspectors and animal  
435 welfare experts to refine the checklist to be used by inspectors and help them better  
436 interpret item compliance. After agreement is reached on the severity of dysfunctions  
437 that may be detected on-farm, the inspections could be focused on what is viewed as a  
438 severe offence to animal welfare or what corresponds to a high risk.
- 439 - define plans for a stepwise improvement of non-compliant farms. These plans should  
440 take into account the severity of dysfunctions (as estimated via the earlier exchanges  
441 between services) and the actual situation of a given farm.

442 In addition, more insight on inspector perceptions of the inspection method, e.g. through  
443 interviews, is needed to confirm our findings here on the way inspectors perform inspections.  
444 Likewise, interviews of farmers should help understand their knowledge and understanding of  
445 the legislation, and identify the barriers to change and potential drivers to improve compliance  
446 on EU legislation to protect farm animals.

447

## 448 **Animal welfare implications**

449 Compliance on legislation does not necessarily mean that animal welfare is fulfilled - indeed,  
450 the legislation contains only minimal requirements - but it is a pivotal basic step towards  
451 ensuring animal welfare. Compliance levels could be improved by taking action to raise  
452 farmers' awareness of major compliance and welfare problems, refining the checklist and  
453 guidelines provided to inspectors (typically via exchange of practice between field inspectors,  
454 ministry central services in charge of animal protection, and welfare experts), and proposing  
455 progress plans to farms that are struggling to comply with legislative requirements.

456

## 457 **Acknowledgements**

458 We thank the French ministry of Agriculture for granting INRA access to the database SIGAL.  
459 We are also grateful to Auvergne Traductions Techniques for checking and amending the  
460 English writing.

461

## 462 **References**

463 **Anneberg I, Vaarst M and Sandøe P** 2013 To inspect, to motivate, or to do both? A dilemma  
464 for on-farm inspection of animal welfare. *Animal Welfare* 22: 185-94.

465 **Baratay E** 2012 *Point de vue animal: Une autre version de l'histoire*. Seuil, 2012, France.

466 **Barkema HW, von Keyserlingk MAG, Kastelic JP, Lam TJGM, Luby C, Roy JP LeBlanc**  
467 **SJ, Keefe G P and Kelton DF** 2015 Invited Review: Changes in the Dairy Industry Affecting  
468 Dairy Cattle Health and Welfare. *Journal of Dairy Science* 98: 7426-7445.  
469 doi:10.3168/jds.2015-9377.

470 **Bayvel ACD, Diesch DJ and Cross.N** 2012 Animal Welfare: A Complex International Public  
471 Policy Issue: Economic, Policy, Societal, Cultural and Other Drivers and Constraints. A 20-  
472 Year International Perspective. *Animal Welfare* 21: 11-18.  
473 doi:10.7120/096272812X13345905673485.

474 **Bock B and Buller H** 2013 Healthy, Happy and Humane: Evidence in Farm Animal Welfare  
475 Policy. *Sociologia Ruralis* 53: 390-411. doi:10.1111/soru.12011.

476 **Bock B, Hacking N and Miele M** 2014 Report on the main problem areas and their sensitivity  
477 to be addressed by knowledge transfer for each of the specific aspects of the legislation chosen  
478 for this project. Deliverable 4 of the project *Coordinated European Animal Welfare Network*  
479 (*EuWelNet*).

480 **Broom D** 1991 Animal welfare: concepts and measurement. *Journal of animal science* 69 :  
481 4167-4175.

482 **Buller H and Roe E** 2014 Modifying and Commodifying Farm Animal Welfare: The  
483 Economisation of Layer Chickens. *Journal of Rural Studies* 33: 141-49.  
484 doi:10.1016/j.jrurstud.2013.01.005.

485 **Danish Center for animal welfare** 2012 *Animal welfare in Denmark 2010*, Ministry of Food,  
486 Agriculture and Fisheries, Danish veterinary and food Administration  
487 [https://www.foedevarestyrelsen.dk/english/Animal/AnimalWelfare/DCAW/Documents/1394\\_7\\_dyrevel\\_uk\\_web.pdf](https://www.foedevarestyrelsen.dk/english/Animal/AnimalWelfare/DCAW/Documents/1394_7_dyrevel_uk_web.pdf)  
488

489 **DEFRA** 2005 *Agriculture in the United Kingdom 2005 : Department for Environment, Food*  
490 *and Rural Affairs*, p 111

491 **EFSA Panel on Animal Health and Welfare (AHAW)** 2012 Scientific Opinion: Guidance on  
492 Risk Assessment for Animal Welfare *EFSA Journal* 10: 29 pp.

493 **Escobar MP and Demeritt D** 2016 Paperwork and the Decoupling of Audit and Animal  
494 Welfare: The Challenges of Materiality for Better Regulation . *Environment and Planning C:*  
495 *Government and Policy*, doi:10.1177/0263774X16646771.

496 **European Commission** 1998 Council Directive 98/58/EC of 20 July 1998 concerning the  
497 protection of animals kept for farming purposes. *CELEX-EUR Official Journal L 221*, 8 August  
498 1998 pp. 23-27

499 **European Commission** 2005 *Special Eurobarometer 229 Attitudes of consumers towards the*  
500 *welfare of farmed animals* [http://ec.europa.eu/public\\_opinion/archives/ebs/ebs\\_229\\_en.pdf](http://ec.europa.eu/public_opinion/archives/ebs/ebs_229_en.pdf)

501 **European Commission** 2007 *Special Eurobarometer 270 Attitudes of EU Citizens Towards*  
502 *Animal Welfare* [http://ec.europa.eu/public\\_opinion/archives/ebs/ebs\\_270\\_en.pdf](http://ec.europa.eu/public_opinion/archives/ebs/ebs_270_en.pdf)

503 **European Commission** 2012 *Communication from the Commission to the European*  
504 *Parliament, the Council and the European Economic and Social Committee on the European*  
505 *Union Strategy for the Protection and Welfare of Animals 2012-2015*  
506 [https://ec.europa.eu/food/sites/food/files/animals/docs/aw\\_eu\\_strategy\\_19012012\\_en.pdf](https://ec.europa.eu/food/sites/food/files/animals/docs/aw_eu_strategy_19012012_en.pdf)

507 **European Commission** 2016 *Special Eurobarometer 442 Attitudes of Europeans towards*  
508 *Animal Welfare*  
509 [http://ec.europa.eu/COMFrontOffice/publicopinion/index.cfm/Survey/getSurveyDetail/instr](http://ec.europa.eu/COMFrontOffice/publicopinion/index.cfm/Survey/getSurveyDetail/instruments/SPECIAL/surveyKy/2096)  
510 [uments/SPECIAL/surveyKy/2096](http://ec.europa.eu/COMFrontOffice/publicopinion/index.cfm/Survey/getSurveyDetail/instruments/SPECIAL/surveyKy/2096)

511 **European Parliament** 2015 B8-1281/2015, *European Parliament resolution on a new animal*  
512 *welfare strategy for 2016-2020*, (2015/2957(RSP))

513 **Finnish Center for Animal Welfare** 2013 *Animal welfare in Finland, a national report on*  
514 *animal welfare*, Evira, In-house Services  
515 [http://elaintenhyvinvointikeskus.edublogs.org/files/2012/02/Animal-Welfare-Report-](http://elaintenhyvinvointikeskus.edublogs.org/files/2012/02/Animal-Welfare-Report-11z5o7w.pdf)  
516 [11z5o7w.pdf](http://elaintenhyvinvointikeskus.edublogs.org/files/2012/02/Animal-Welfare-Report-11z5o7w.pdf)

517 **French ministry of agriculture** 2016 *Stratégie française pour le bien-être animal 2016-2020*



518 [http://agriculture.gouv.fr/sites/minagri/files/160627\\_ani\\_bea\\_strategie.pdf](http://agriculture.gouv.fr/sites/minagri/files/160627_ani_bea_strategie.pdf)

519 **Grandin T** 2010 Implementing effective standards and scoring systems for assessing animal  
520 welfare on farms and slaughter plants. In: Temple Grandin (ed.) *Improving animal welfare: a*  
521 *practical approach* pp. 32–49. CAB International : Wallingford, UK

522 **Kjaernes U, Miele M and Roex J** (eds.) 2007 Attitudes of Consumers, Retailers and Producers  
523 to Animal Welfare. Welfare Quality Reports Cardiff University: Cardiff, UK

524 **Kuhn G, Pyczak T, Sievert H and Häring G** 2008 Implementation of cross-compliance in  
525 the area of animal welfare *Dtsch Tierarztl Wochenschr.* 115(3):89-92 (Abstract)

526 **Lipsky M** 1980 *Street-Level Bureaucracy: Dilemmas of the Individual in Public Services.*  
527 Russell Sage Foundation : New York, US

528 **Manteca X , Butterworth A, Main D and Velarde A** 2013 *Report presenting the rationale of*  
529 *the undertaken strategies for knowledge transfer and the results of their implementation,*  
530 *including the reasons for success or failures.* 17 pp.

531 **Miele M, Veissier I, Evans A and Botreau R** 2011 Animal welfare: Establishing a dialogue  
532 between science and society. *Animal Welfare* 20: 103-117.

533 **Nitsch H and Osterburg B** 2007 Efficiency of cross compliance controls – public  
534 administrative costs and targeting *Deliverable 18 of the CC Network Project, SSPE-CT-*  
535 *2005-022727.*

536 **R Core Team** 2016. R: A language and environment for statistical computing. R Foundation  
537 for Statistical Computing: Vienna, Austria.

538 <http://www.R-project.org/>.

539 **Tremetsberger L and Winckler C** 2015 Effectiveness of animal health and welfare planning  
540 in dairy herds: a review. *Animal Welfare* 24: 55-67.

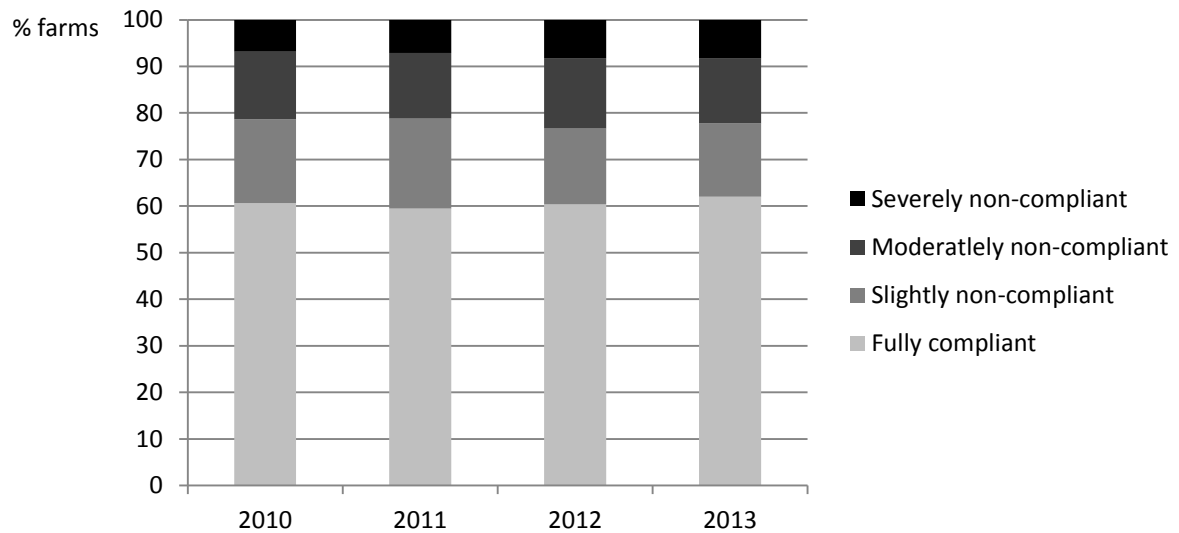
541 **Webster AJF** 2009. The Virtuous Bicycle: a delivery vehicle for improved farm animal  
542 welfare. *Animal Welfare* 18: 141-147.

543 **Whay HR and Main DCJ** 2015 Improving animal care and welfare: Practical approaches for  
544 achieving change. In: T Grandin (ed.) *Improving Animal Welfare: a practical approach* 2<sup>nd</sup>  
545 Edition pp. 291-312. CAB International: Wallingford, UK.  
546 **You X, Yibo L, Min Z, Huoqi Y and Ruqian Z** 2014 A survey of chinese citizens'  
547 perceptions on farm animal welfare . *PloS one* 9: e109177.

548

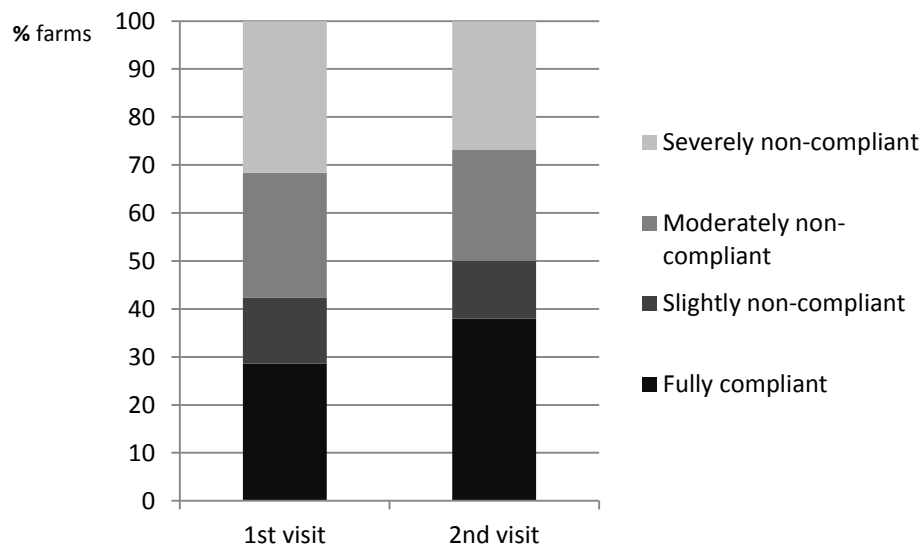
549 **Figure 1 Distribution of the overall assessment of the farms over years and between two**  
 550 **consecutive visits**

551 **Figure 1a Trend over years at first visit (only farms visited once, n = 9327)**



552

553 **Figure 1b Changes from first to second visit (only farms visited twice, n = 1155)**

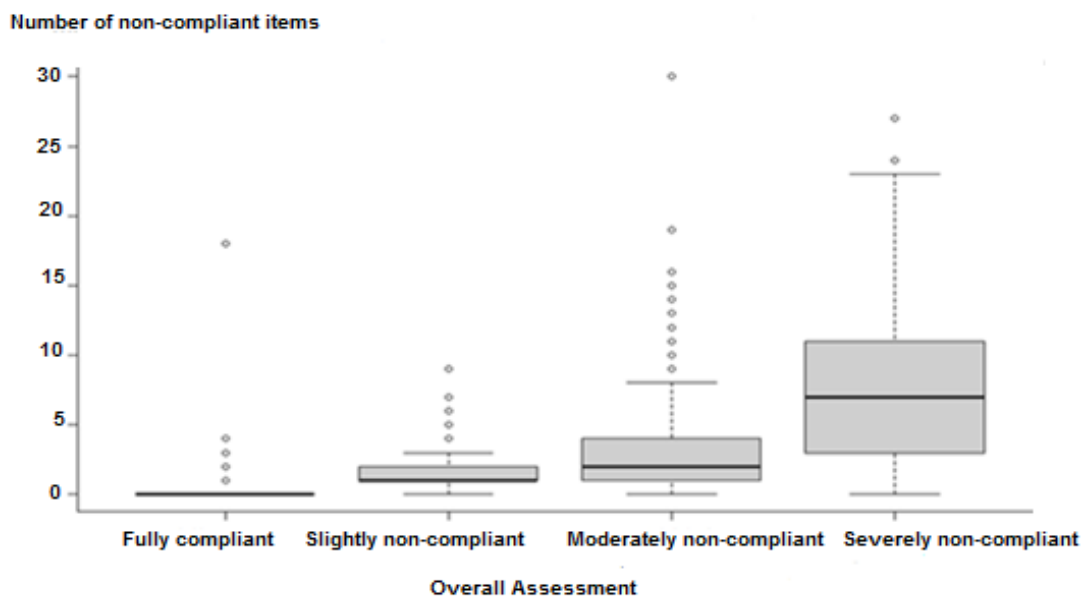


554

555

556 **Figure 2 Number of items counting non-compliances according to overall assessment of**  
557 **farm compliance (box plots)**

558



559

560

561

562 **Table 1 Distribution of non-compliance among items. Only farms visited once are**  
 563 **included in the analysis (n = 9327).**

Area	Item	% Farms		
		C <sup>1</sup>	NC <sup>2</sup>	NR <sup>3</sup>
<b>Housing</b>				
	Protection against adverse weather and predators when outdoors	78.70	2.30	19.00
	Outside enclosures clear of harmful objects such as metal or plastic scraps or disused machines	71.08	10.48	18.44
	Outside enclosures well delimited	76.87	3.64	19.49
	Building materials not harmful to animals	77.41	2.93	19.66
	Equipment and building materials easy to clean and disinfect	72.23	7.67	20.10
	No sharp edges likely to harm animals	76.45	3.37	20.18
	Soils allowing waste disposal	74.70	4.55	20.75
	Quality of ambient air (gases and dust)	80.91	1.66	17.43
	Temperature and humidity	79.58	1.30	19.12
	Intensity and cycle of daily lighting (if artificial lighting)	57.18	2.80	40.02
<b>Equipment</b>				
	Feeding and watering devices designed to avoid contamination	90.69	5.41	3.90
	Feeding and watering devices designed to avoid competition between animals	92.95	2.95	4.10
	Adequate functioning of feeding and watering devices	90.77	4.76	4.46
	Functioning of ventilation devices (if artificial ventilation is used)	4.33	0.02	95.65
	Functioning of the back-up ventilation system and system alarms (if artificial ventilation is used)	3.81	0.01	96.18
	Daily check of equipment	87.61	1.68	10.71
<b>Staff</b>				
	Knowledges and qualifications	95.39	3.09	1.53
	Adequate staff numbers	96.34	2.32	1.35
<b>Management</b>				
	Frequency of inspections of the animals	96.97	1.95	1.08
	Lighting suitable for animal inspections	83.99	0.88	15.13

No mutilation (female castration or dehorning after 4 weeks of age without anaesthesia)	97.05	0.81	2.14
Farming practices avoiding severe or long lasting pain or harm	93.34	5.59	1.08
If in use, tethering systems allowing basic behaviours	90.36	3.03	6.61
Prompt treatment of ill or injured animals	85.04	4.84	10.12
No ill or injured animals left without proper care	88.25	4.58	7.17
Isolation of ill or injured animals	82.85	4.49	12.67
Consultation of a veterinarian when needed	87.82	4.25	7.92
Resources			
Quantity and quality of feeding	93.00	6.09	0.91
Frequency of feeding	95.63	3.16	1.21
Quantity, quality and frequency of watering	93.66	5.79	0.56
Safety of drugs administered to animals (excluding prescriptions by a vet)	78.77	1.38	19.85
Documentation			
Farm records compliant with legislation	64.84	24.21	10.95

564 <sup>1</sup>Compliant: the farm is compliant for this item

565 <sup>2</sup>Non Compliant: the farm is non-compliant for this item

566 <sup>3</sup>Not Relevant: this item is not relevant on that farm.

567 **Table 2 Impact of item-level compliances on the overall assessment of a farm (logistic**  
568 **regression). Only farms visited once are included in the analysis (n = 9327). Following a**  
569 **stepwise procedure, 9 items were not kept in the final model.**

Area			
Item	OR <sup>1</sup>	P <sup>2</sup>	Risk <sup>3</sup>
<b>Housing</b>			
Protection against adverse weather and predators when outdoors		Not kept	
Outside enclosures clear of harmful objects such as metal or plastic scraps or disused machines	1.47	***	15.4
Outside enclosures well delimited	2.64	***	9.6
Building materials not harmful to animals	1.98	***	5.8
Equipment and building materials easy to clean and disinfect		Not kept	
No sharp edge likely to harm animals	1.69	***	5.7
Soils allowing waste disposal	1.65	***	7.5
Quality of ambient air (gases and dust)		Not kept	
Temperature and humidity	0.35	***	-
Intensity and cycle of daily lighting (if artificial lighting)	2.03	***	5.7
<b>Equipment</b>			
Feeding and watering devices designed to avoid contamination	1.35	***	7.3
Feeding and watering devices designed to avoid competition between animals	1.47	***	4.3
Adequate functioning of feeding and watering devices	1.82	***	9.3
Functioning of ventilation devices (if artificial ventilation is used)		Not kept	
Functioning of the back-up ventilation system and system alarms (if artificial ventilation is used)		Not kept	
Daily check of equipment	1.77	***	3.0
<b>Staff</b>			
Knowledges and qualifications	3.81	***	11.8
Adequate staff numbers		Not kept	
<b>Management</b>			
Frequency of inspections of the animals		Not kept	
Lighting suitable for animal inspections	1.73	NS	-
No mutilation (female castration or dehorning after 4 weeks of age without anaesthesia)		Not kept	

Farming practices avoiding severe or long lasting pain or harm	3.06	***	17.1
If in use, tethering systems allowing basic behaviours			Not kept
Prompt treatment of ill or injured animals	1.78	***	8.6
No ill or injured animals left without proper care	1.78	***	8.2
Isolation of ill or injured animals	1.68	***	7.5
Consultation of a veterinarian when needed	3.91	***	16.6
Resources			
Quantity and quality of feeding	2.54	***	15.5
Frequency of feeding	2.6	***	8.2
Quantity, quality and frequency of watering	1.82	***	10.5
Safety of drugs administered to animals (excluding prescriptions by a vet)	0.48	NS	-
Documentation			
Farm records compliant with legislation	4.17	***	101.0

570 <sup>1</sup> Odds ratio

571 <sup>2</sup> Probability. \*\*\*, P < 0.001; NS, not significant.

572 <sup>3</sup> Risk = OR × % farms non-compliant at first visit (from Table 1). Calculated only when the OR is  
573 significant.

574

575

576



577 **Table 3. Impact of item-level compliances on the overall assessment of a farm when visited**  
578 **for the first vs second time (logistic regressions). Only farms visited twice are included in**  
579 **the analysis (n = 1155). Only 13 items were significant on first or second visit and were**  
580 **kept in the final models.**

Area Item	Visit 1		Visit 2	
	OR <sup>1</sup>	P <sup>2</sup>	OR	P
Housing				
Outside enclosures clear of harmful objects such as metal or plastic scraps or disused machines	2.05	***	2.64	***
Soils allowing waste disposal	1.55	***	1.46	NS
Temperature and humidity	2.33	***	1.41	NS
Equipment				
Feeding and watering devices designed to avoid contamination	0.63	***	2.35	**
Adequate functioning of feeding and watering devices	2.13	***	0.93	*
Staff				
Knowledges and qualifications	2.15	***	0.85	**
Management				
Farming practices avoiding severe or long lasting pain or harm	1.98	***	2.25	***
Prompt treatment of ill or injured animals	3.87	***	1.98	***
Isolation of ill or injured animals	2.40	***	2.00	***
Consultation of a veterinarian when needed	3.89	***	2.47	***
Resources				
Quantity and quality of feeding	4.07	***	5.13	***
Safety of drugs administered to animals (excluding prescriptions by a vet)	2.81	***	0.23	NS
Documentation				
Farm records compliant with legislation	2.40	***	2.00	***

581 <sup>1</sup> Odds ratio

582 <sup>2</sup> Probability. \*\*\*,  $P < 0.001$ ; NS, not significant

583

584