

Perceptions and practices of farm record-keeping and their implications for animal welfare and regulation

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EXECUTIVE SUMMARY

Objective: This Defra social science research fellowship project responded to evidence needs within the Animal Welfare Directorate and Better Regulation Team to understand how farmers keep and use legally required records for animal welfare so as to improve regulatory effectiveness and identify unnecessary administrative burdens on agriculture.

Methodology: The project combined desk-based evidence review with on-farm field visits to 16 farms (9 pig and 7 dairy), and 25 semi-structured interviews with farmers and stock-keepers, as well as a further 6 interviews with inspectors (4 government and 2 private schemes) to get their perspective on how records are and should be used for animal welfare. Interviews were transcribed and coded to identify emerging themes that were then compared across respondents and cross-checked against regulatory guidance and other documentary evidence. While the sample size was small and this could be seen as a limitation for generalisations, responses were consistent and recurrent; analytical saturation was reached before the target number of interviews was completed such that further interviews did not add new information but simply confirmed and reiterated the findings from the previously completed ones.

Findings:

1. The following findings were universal within the sample. Farmers and regulators understand the purpose of record-keeping in different ways that reflect their competing understandings of 'good' animal husbandry practice.
2. Farmers understand record-keeping to be about satisfying external accountability demands from government and private assurance schemes. Farmers generate and maintain a variety of records to comply with their legal duties on disease control, food safety and animal welfare rather than for any of their own purposes. Paperwork to comply with such requirements is something farmers try to catch up with around the edges of their primary duties on the farm of looking after their stock. For their own management purposes farmers are avid keepers and users of a host of self-designed records. Consequently, they tend to perceive regulatory record-keeping as onerous, even if the need for it in order to maintain consumer confidence and control disease outbreaks was generally accepted by the farmers interviewed.
3. Regulatory guidance assumes that farmers are keeping records to inform their own farm planning and animal husbandry. This view was also evident in the interviews with inspectors. Consequently, animal welfare record-keeping requirements are understood

as a light touch process of auditing records that farmers should already be working with anyway, rather than one that creates any additional paperwork for farmers.

4. Not a single one of the 25 farmers interviewed use the records they are required to keep to inform their own animal welfare practices. This is partly because despite regulatory permissiveness about the medium in which information can be recorded –records can be kept on paper, electronically or in any other hardware formats– there is no flexibility about the units of account or data fields that must be recorded under EU Directives for food safety and animal health. Farmers find it difficult to extract useful information for animal welfare from records originally designed for other regulatory purposes. More importantly though, it is because farmers believe good husbandry is about identifying problems as they arise and dealing with them on the spot rather than monitoring records to identify issues. For them, ensuring welfare depends on experience and sensitivity; it is about spending time with the animals and making sure they are comfortable and healthy. Record-keeping played no role in their practices of animal care.
5. By contrast regulators associate record-keeping with good animal husbandry. They believe that improvements in animal welfare can be driven by benchmarking performance and recording progress. They believe that monitoring animal welfare indicators will help farmers anticipate problems and manage them more effectively.
6. These conflicting assumptions about record-keeping and good animal husbandry explain the resistance of farmers to Defra’s efforts to promote the active use of farm health plans. Whereas regulators have assumed that records drive animal welfare practice, farmers see farm work and paperwork as two different things. For them care comes first, and records follow on afterwards to satisfy external demands for assurance. As a result there is a tendency for on-farm animal care practice to become de-coupled from the legally required records scrutinised by inspectors when they assess regulatory compliance.
7. The records farmers keep for themselves are primarily about animal management and productivity. There is a significant variation by sector and by individual farmer in what is recorded and how. This heterogeneity, combined with the mismatch between productivity records and welfare indicators, will make it challenging to devise consistent guidance for inspectors that might enable them to use farmers’ own records to measure compliance with the law or with private assurance schemes.

Policy implications and possible next steps:

1. An improved understanding of farm practice and of farmers’ own ideals of good animal husbandry would help regulators' efforts to reduce unnecessary administrative burdens and align EU record-keeping requirements with opportunities for improved animal welfare practice.
2. In keeping with the open-policy making agenda, there may be opportunities to engage with farm industry groups, private assurance scheme operators, and software designers

to develop harmonized IT solutions that would enable farmers to satisfy various sector-specific record-keeping requirements more efficiently and in ways that could support more convenient analysis of EU-required records to improve animal welfare.

3. Given the de-coupling of record-keeping from animal care practice, more outcome focused, 'show me, tell me' styles of animal welfare inspection may provide an assurance mechanism better aligned with farmers' own understandings of good practice than auditing paperwork¹. However, inspections of this kind require more expertise, which involves costs for regulators, and depend to a greater degree on individual inspector discretion, which can create uncertainties among regulatees about whether they are compliant. While the current system is unpopular with farmers, it is not clear that the alternatives would be any less so. Given that this research did not consider the wider inspection regime, further research on inspection and enforcement practice would be needed to identify and assess possible innovations to inspection regimes.
4. There may be opportunities to engage with farm industry groups, private assurance scheme operators, and animal welfare NGOs to explore the potential for redesigning farm health planning guidance in ways that might better meet the sector-specific needs of farmers. Such open-policy making might help increase the uptake and use of farm health plans.

¹ While this report was focused only on the use of records – and not the wider inspection regime – it was very clear that the inspectors interviewed saw records and their use as important for ensuring welfare and as an integral part of inspection.

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1. INTRODUCTION

Alongside feeding, mucking out, and other work caring for animals, livestock farming in Britain also involves increasing volumes of paperwork to meet the overlapping demands of food safety, biosecurity and animal welfare regulation, amongst others. As well as government regulation, livestock farmers are also subject to a multitude of demands from private sector assurance schemes. Though formally voluntary, certification of one sort or another is often required by the major retailers in Britain, making these ostensibly voluntary requirements difficult for farmers to ignore (Davey and Richards, 2013). Indeed, in the animal welfare domain, the number and stringency of private assurance scheme requirements far exceed those set down by law (Roe and Murdoch, 2006).

Complying with this multitude of paperwork requirements is laborious, and complaints about red tape feature regularly near the top of the list of farmer concerns (Defra, 2007). The Macdonald (2011: 5.01) review of farming regulation found that “if there is a single ‘universal’ complaint from farmers ... it is paperwork. Almost all consultees identified ‘forms’ as the single most burdensome and arduous aspect of any regulation.” AHVLA statistics show that the single most common cause of animal welfare breaches in random cross-compliance inspections on animal welfare is poor paperwork. In this context, farmers are being sanctioned not because they are causing substantive harm to animals, but because they cannot keep up with the paperwork required by regulation.

Reducing these administrative burdens and making regulation more efficient and effective has been a priority for successive governments. Regulators across government are now required to use ‘risk-based’ prioritization to target enforcement on businesses posing the greatest non-compliance risks (Demeritt *et al.*, 2015). Thus in the animal welfare domain, members of approved food assurance and certification schemes can ‘earn recognition’ and face less frequent inspection by government inspectors. Defra (2013a) has also tried to streamline farm regulations and associated inspections, encouraging the Rural Payments Agency (RPA), the Animal Health and Veterinary Laboratories Agency (AHVLA)² and other regulators to share data and coordinate their demands for information so that records required for one regulatory purpose can be reused to serve another. Defra (2013b) is also looking for ways to make more use of farmers’ own internal record-keeping

² The AHVLA was rebranded the Animal and Plant Health Agency in October 2014, but since it was the AHVLA at the time of my research I will persist in using the old name.

to reduce administrative burdens further and support a more outcomes-oriented approach to regulation.

This report explores the potential for doing so in the specific context of animal welfare regulation. It responds to a specific evidence need identified in a recent review of social research on farmer behaviour with respect to animal welfare, compiled by the author while serving as a social science fellow with Defra's Animal Welfare Team (Escobar and Buller, 2014). That evidence review highlighted the need for more research about the record-keeping practices of farmers, the barriers to getting farmers to use records to inform their own farm management and animal welfare practice, and the reasons for the high rates of non-compliance with record-keeping requirements and the low uptake by farmers of the Farm Health Plans recommended in Defra (2003) guidance as best practice. As well as meeting those specific evidence needs, this report also responds to the needs of the Better Regulation Team to understand compliance behaviour and identify unnecessary administrative burdens on agriculture.

To that end, this report documents farmers' record-keeping practices and their understandings of the roles those records play in both regulation and their own farming practice. It explores tensions between farmers' understandings of record-keeping and of good animal husbandry and those articulated in official guidance from Defra (2001, 2003; FAWC, 2011) and animal welfare experts (Main *et al.*, 2014), and inspectors. Conceptually, it draws on recent work in critical social science on audit and paperwork. Research in policy studies and public administration has highlighted the dual tendency for audit processes both to become de-coupled from the qualities they are meant to assure and to proliferate, distorting performance and colonizing organizational culture to emphasize tick-box compliance. In turn, in Science and Technology Studies (STS) scholars have approached paperwork as technology embodying various physical properties and pre-designed behavioural scripts that shape their use and potential for adaptation to other purposes. That background framing literature is reviewed in the second section of the report. The third section then describes the methods of data collection and analysis. Findings are then presented in four further sections, focused on three major types of animal welfare records required by government guidance and regulation (mortality records, medicine records, farm health plans) and on the records farmers keep for their own purposes. There is then a discussion section, which distils from those findings about specific records some more general conclusions about farmers' understandings of welfare, its relationship to record-keeping, and the potential for using farmers' own records as a basis for external animal welfare inspection and assurance. The paper then closes with a brief discussion of the policy implications of these findings for the efforts of the current government (Conservative Party 2015: 21) to reduce administrative burdens on farmers and some possible next steps.

2. AUDIT, ASSURANCE AND ANIMAL WELFARE REGULATION

Animal welfare regulation has traditionally emphasized enforced self-regulation (Braithwaite, 1982). While there is a long history of legislation to prevent animal cruelty and protect animal welfare, it is largely principles-based, imposing broad duties on farmers rather than mandating detailed requirements for the practice of animal husbandry (Roe and Murdoch, 2006; Woods, 2011). This tendency has only been accentuated by the Europeanization of animal health and welfare regulation through a series of Framework directives introduced through the 1990s and 2000s to harmonize standards of protection and ensure a level playing field across the common market. To flesh out those broad duties and provide guidance as to what they might entail, farmers have been encouraged to follow various voluntary, but recommended codes of practice. Over time, these codes have steadily grown in size and scope. As well as providing more detailed instruction about what is expected, they increasingly emphasize the need for farmers to show that they have followed good practice. The first voluntary Codes of Recommendations for the Welfare of Livestock, published in 1969, expected “The good stockman,” (MAFF 1969, page 2) to “know the signs which indicate good health ... recognise impending trouble in its earliest stages ... identify the cause and put matters right immediately”. The latest version of the Codes counsels that “people who care for livestock should demonstrate” that they have observed the so-called ‘five freedoms’ developed by the Farm Animal Welfare Council (Defra, 2003, page 2). Following good practice is no longer enough: it must also be seen to be done.

Compliance with welfare standards is enforced through inspection by a number of external regulators. Generalist auditors from the Rural Payments Agency verify compliance with various record-keeping requirements under so-called ‘cross-compliance’ inspections mandated by EU Regulation 1782/2003 reforming the CAP, while specialist veterinary inspectors from the AHVLA monitor compliance with the EU Animal Welfare Directive (98/58/EC). The AHVLA also work closely with local authorities, who have statutory responsibility for enforcing UK animal welfare regulations (BIS 2015, NAO 2012). As well as responding to regulatory breaches with advice and information, inspectors can also deploy an escalating ‘enforcement pyramid’ of more punitive sanctions against non-compliant farmers who may see their CAP subsidy payments reduced³ or face court fines and even jail for the most serious breaches. Compliance with the various welfare standards required by the major retailers is certified by private farm assurance scheme auditors (Main *et al.*, 2014).

Such audit-based approaches to regulation have become increasingly common--- and controversial-- in Britain. Geographers often approach audit under the sign of

³ Whereas cross-compliance breaches due to negligence face a 3% reduction in CAP Single Payment Scheme subsidy per violation, there is 20% penalty for intentional non-compliance, with tariffs adjusted upwards or downwards depending on the extent, severity and permanence of the violation.

neoliberalization (Clifford and Tewdwr-Jones, 2013; Haggerty et al., 2009; Holden, 2014; Lockie and Higgins, 2007; Mills and McCreary, 2013). Kipnis (2008) however highlights the ambiguity of the designation 'neoliberal' whose force and meaning vary depending both on the place and disciplinary circuits in which it is invoked. Moran (2003) and Hood et al. (1999) associate it with the dissolution of an old style of 'club government', negotiated in secret by elites, in favour of more formalized, transparent and externally accountable styles of governance, often operating at arms-length from the state rather than through statutory mandate or direct state ownership. Others understand audit and assurance schemes as strategies for so-called 'better regulation' that eschews command-and-control in favour of more proportionate and flexible approaches to achieving regulatory goals through educational, voluntary or market-based interventions to change attitudes and behaviour without prescriptive rules requiring costly and heavy-handed enforcement by the state (BRTF, 2003; Dodds, 2006; Shove, 2010). In the specific case of animal welfare, tapping into farmers' own record-keeping promises to be better targeted and more 'light-touch' in its demands for compliance paperwork to assure that standards are being met (NAO, 2012). It also promises to drive up standards by encouraging farmers to use their records to benchmark and enhance animal welfare (FAWC, 2011).

However, a critical literature on audit suggests the potential for several perverse and unintended consequences of this approach to using records for animal welfare regulation (Power, 1997; Strathern, 2000). Michael Power (1997) highlights two 'pathologies' of audit. First, focusing compliance activity on record-keeping tends to de-couple it from the outcomes those records are meant to assure. Regulatory compliance and quality assurance can become a self-referential process of auditing paperwork that is detached from everyday practice. Second, using records for audit tends to displace their original purpose. Maintaining an audit trail can become an end in itself that colonizes organizational culture and distorts performance, whether through calculated gaming of targets (Bevan and Hood, 2006) or routinized generation of paperwork that distracts from organizational priorities (Brewer and Walker, 2010).

Rather than focusing on the organizational pathologies to which auditing paperwork gives rise, a complementary body of work in anthropology, media studies and science and technology studies (STS) highlights the materiality of record-keeping and the work that paper does to shape social life and government through its physical forms and its circulation (Gitelman, 2014; Hull, 2012; Vismann, 2008). Charting the history of filing technologies from the clay tablets and scrolls of the ancient world to the dawn of the digital age, Vismann (2008) argues that they were crucial to effecting the binary distinction between "abstract law on one side and the agencies that set down and enforce the law on the other" on which the impartial rule of law depends. These distinctions do not always hold, and in his ethnography of urban governance in Pakistan, Hull (2012) shows how paper, in the form of permits, maps, and petitions, is a source of power, but one that administrators are not

always able to control. Sometimes this is because of resistance to the authority of government agencies; and other times because their authority and legitimacy depend on authenticating, circulating and reproducing paperwork, and these are often very challenging tasks.

Hull's analysis builds on a tradition of STS research on the social shaping of technology. As technologies, records are given form and meaning through everyday practice and involve what Latour (1987, page 87) terms "trials of strength" as users try to subvert and locally adapt the standards (Timmermans and Epstein, 2010) and behavioural 'scripts' (Akrich, 1992) hard wired into regulatory objects like flood maps (Porter and Demeritt, 2012) and the British Cattle Tracing System (Singleton, 2012). This work suggests that the challenges to using farmers' records for animal welfare regulation may not lie solely in the pathologies of audit, but also in the practical difficulties of adapting the technological objects of audit to somewhat different purposes.

3. METHODS OF DATA COLLECTION AND ANALYSIS

To explore these questions about record-keeping and animal husbandry, the project combined desk-based research with interviews and field visit to 16 farms in the dairy (n=7) and pig (n=9) sectors to observe farm records and record-keeping first hand. These sectors were chosen because they have the highest rates of compliance with record-keeping requirements. As such their study might identify lessons about the factors encouraging the use of records that might be applied to the sheep and beef cattle sectors where compliance is lower. On the other hand, if even the most compliant livestock sectors report problems with paperwork, they are likely to be even more keenly felt in those sectors experiencing greater difficulties in complying with record-keeping requirements.

Farmers participating in the research were recruited through industry levy bodies—British Pig Executive and DairyCo— whose regional field operators approached farmers with an invitation letter describing the project and asking for volunteers willing to participate in a programme of on-farm site visits and interviews. The pig farms sampled for study ranged in size from a small enterprise with less than 25 breeding sows to large commercial operations with 1000 breeding sows, or more than twice the national average of 447. Dairy farms in the sample varied much less in size, ranging from just below the national average of 125 milking cows to several farms with over 300 cows.

As farm proprietors and hired stock-people may keep and use records in different ways and for different purposes, when possible and in agreement with the farmers, separate interviews were conducted on-site with both the farmer and the stockperson. In total, 25 farmers and stockpersons were interviewed. Interviews focused on record-keeping practices, the ways those records are used, both by farmers and inspectors, and on

informants' understandings of animal welfare, good animal husbandry, and the regulatory process.

Since the research was intended to find out about if and how farmers use the legally required records in their practices to ensure animal welfare, in addition to these interviews with livestock keepers, a parallel set of interviews was conducted with 4 government inspectors to get their views on how records should be used for animal welfare. The research was not designed to address the wider inspection regime, but the role of records and paperwork in regulatory audit and assurance quickly emerged as a common theme in interviews with farmers, stockpersons, and inspectors alike and so what was initially envisioned as 1-2 background interviews was expanded so as to confirm the initial findings about how frontline enforcement see welfare record-keeping and how that may differ both from what is written in the formal policy documents and from what farmers understand record-keeping to be about. Under Defra's risk-based approach to inspection, members of certified farm assurance schemes can 'earn recognition' that exempts them from random and routine inspection by the AHVLA. Thus, these private auditors play an increasingly important role in ensuring compliance with animal welfare standards and therefore two more interviews were conducted with private sector assurance scheme certifiers to gain insight about their views on how animal welfare record-keeping requirements should be used by farmers, which were found not to differ from those of government inspectors.

All the interviews were recorded and transcribed. Analysis involved inductive coding of the resultant 487 pages of interview transcripts to identify and cross-check emerging themes about record-keeping and record-usage. Thematic codes were then compared across informant type to assess relative frequency and highlight outliers and points of consensus among different informant types. Interview results were then compared against the findings from the policy document analysis to identify continuities and disjunctures between the everyday understanding and experience of records and record-keeping and the official views of veterinary experts and formal animal welfare policy. In the analysis that follows, informants are identified by an individual alphanumeric code (F=farmer; SP=stockperson; I=inspector), so as to protect their anonymity, as promised in the research protocol.

4. ANIMAL RECORD-KEEPING: WELFARE REQUIREMENTS AND USES

In addition to whatever records farmers may keep and use for their own purposes, the law requires farmers to keep a variety of records on their stock and to make these available for auditing by government inspectors. Other record-keeping, such as farm plans, is not legally required but merely recommended by some of Defra's species specific Codes of Recommendations for the Welfare of Livestock (i.e. Defra, 2003), which have a statutory

basis but are still formally voluntary, and often also as a condition for membership of a private assurance scheme.

The analysis that follows focuses first on the three major types of records that the government requires or strongly recommends that farmers keep for animal welfare purposes: mortality records, medicine records, and the farm health plan. For each of these, the report describes the roles these records are understood to play in regulatory assurance and in the practice of animal husbandry by farmers and by the inspectors charged with enforcing animal welfare standards. Then the report presents the findings about the records farmers keep for their own purposes to monitor animal productivity.

Recording death

The legal requirement of the Welfare of Farmed Animals (England) Regulations 2007 (WOFAR) for farmers to maintain a record “of the number of mortalities found on each inspection of animals” has its origin in a series of European Directives passed in the early 1990s. “With a view to the completion of the internal market”, the 1990 Directive on Veterinary and Zootechnical Checks (90/425/EEC) abolished border controls on animals traded within the common market and imposed in their place a harmonized system of certified inspections for “safeguarding public health and animal health”. In the shadow of the BSE crisis, a further Directive (92/102/EEC) on the Identification and Registration of Animals extended record-keeping requirements first imposed by 90/425/EEC to enable the tracing of veterinary checks to require farmers to record and make available for inspection records of the birth, movement, and mortality of all farmed cows, pigs, sheep, and goats, which, as the fifth recital to the Directive noted, farmers were probably recording already to “maintain up-to-date records of the animals on their holdings”. Further spill-overs from one purpose to another saw these animal registration records then tapped for the administration of EU agricultural subsidies (Council Regulation EEC 3508/92), the establishment of a surveillance system for animal disease (Council Directive 97/12/EC) and food labelling to boost consumer confidence (Regulation 1760/2000/EC).

In a similar manner, mortality records initially kept for food safety and agricultural subsidy purposes were then appropriated for animal welfare. To ensure “uniform application” of the broad principles of the 1978 European Convention for the Protection of Animals Kept for Farming Purposes (78/923/EEC), Council Directive 98/58/EC sets out a series of further rules, including those for record-keeping to enable member states to ensure animal keepers are complying with the requirements. An Annex to the Directive stipulates that “the owner or keeper of the animals shall maintain a record of any medicinal treatment given and of the number of mortalities found at each inspection.” No format or level of reporting detail is specified beyond the requirement that records be kept and made available for inspection. However, a later Council Decision (2006/778/EC) standardizes the format for member states to report to the Commission on the results of their own animal

welfare compliance inspections, including a specific requirement to report on the number of record-keeping violations.

As STS scholars emphasize (e.g. Latour, 1987; Vismann, 2008), this expansion in the regulatory purposes served by recording mortalities is made possible by the material properties of those records themselves. The records kept by farmers are relatively immutable and inspectors related how much they could glean from them about the assiduousness with which farmers cared for their animals by seeing whether or not paperwork was written with different pens, suggesting regular monitoring and usage. At the same time the mobility of these written traces also allowed the same paperwork to speak for fair commerce, equitable subsidies, disease control, consumer satisfaction and caring husbandry practices.

This proliferation of regulatory purposes is accompanied by an increase in the number of regulatory bodies requiring them: at least 5 different types of official Government inspection and innumerable private sector certifiers check the mortality records (Defra 2013c). The pressure on inspectors to verify these records is substantial: errors in certifying stock numbers can mean repayments to the EU and undermine disease surveillance. Tallying them with carcass disposal records ensures compliance with fallen stock regulations and enables the inspector to verify “whether the farm records agree with any relevant databases” (AHVLA, 2014). Mortality records also provide inspectors with a rough indicator of animal welfare and they often reported using them to inform their compliance judgements. I6 explained how s/he used them to start conversations with the farmer about care:

“you will check that period of mortalities [and if the farmer explains] these calves were very poorly [then you say] well then, show me on your records that you treated them ... and you did try to improve their health?”

Veterinary inspectors hope that farmers will use their mortality records in the same way: as an indicator and self-assessment tool to help them monitor and improve animal welfare. As auditors explained, the records are essential to explain and thereby control mortality. Without them farmers

“cannot make linkages between why suddenly at the end of the rearing period they’ve had a 6% mortality when the previous six months they’ve had 3%” (I1).

Nor, inspectors explained, can they know, “if they are getting more calf deaths in the winter? ... or was it in the spring?” (I2), which would suggest different mortality causes.

Inspectors had a normative vision of the ‘good’ farmer as an analytical farmer, using records to audit on-farm performance, set targets for improvement, and assess progress at

meeting them. While the formal requirements for animal welfare record-keeping appear quite light-touch, since farmers were already required to record mortality for other regulatory purposes, meeting these informal expectations of front line inspectors was sometimes more demanding: as I1 explained, achieving good animal welfare really required that farmers should also record “the details of why these animals are dying” because “if you don’t, you’re never going to be able to relate it to a particular building or age” and thereby prevent it from happening again. While inspectors were formally required to ensure that mortality was being recorded as required by law (AHVLA 2014, RPA 2014), they also wanted those records to be analysed as well. This expectation that “Recording of mortalities is a useful management tool” is written into the guidance document given to AHVLA (2014) inspectors about how they should assess compliance with WOFAR duties.

But these ideals of animal welfare practice were not always reflected in the WOFAR rules as written. To minimize burdens the Welfare Directive (98/58/EC) allowed farmers to satisfy its record-keeping requirements with “equivalent information ... kept for other purposes”. Thus when asked about their mortality records, many farmers referred to the records they kept on carcass disposal under the Animal By-Products (Enforcement) (England) Regulations 2011 and Regulation (EC) 142/2011. Dairy farmers often pointed to their animal movement records. Cattle are individually tagged and farmers must report the dates of each individual death to the British Cattle Movement Service within 7 days (Singleton, 2012). Using movement records for mortality was more difficult for pig farmers, because pigs are not registered individually but with a County Parish Holding Number for tracing pork back to its source. To generate mortality records from their movement records, pig farmers had to compare their herd size at different time periods and calculate the total number of deaths over the period while allowing for different rearing periods and pigs taken to slaughter. Without definitive guidance, farmers worked out a number of individual strategies, which varied widely within and between sectors, for reworking existing records so as to satisfy mortality record-keeping requirements. Some looked to records kept about the productivity (i.e. milk volumes or piglet production) and dates of insemination and farrowing/calving of individual animals, while others used herd-level inventories to derive the number who died on-farm.

In practice such alternative records were not always acceptable to inspectors, despite the explicit allowances made for them in the Welfare Directive. AHVLA (2014) guidance for inspectors noted:

“Key livestock sectors likely to be recording less frequently are sheep and pigs, who may record final numbers alive at the end of a rearing period and calculate the difference from live births recorded. This is not acceptable for meeting WOFAR or XC [EU cross-compliance] requirements.”

However front-line inspectors found that interpreting those requirements was “a bit of a grey area” (I6). As research on inspection in other policy domains has shown (Hawkins 2002), animal welfare inspectors used their discretion in assessing compliance with the law. As I1 noted, “with cross-compliance, a lot of the failings were on mortality records”, because “farmers don’t really know the difference between mortality records and their animal by-product records” (I6). For the former farmers must note the date and time they discovered any on-farm mortality and retain these records for three years, whereas the latter require them to record how they disposed of the carcass and retain those records for just two years. Compliance with the latter was generally better than the former:

“in my experience... I don’t find the average situation I go to, that they have very accurate, if indeed any, mortality records. They will faithfully keep their receipts if things have had to go to the knackerman as in their animal by-products regulations...but you won’t have any sort of sensible records of mortality. I’ve struggled with those and I think it’s something that’s really lacking with most farmers” (I5).

Generating the records required by law was not sufficient for the sort of anticipatory analysis expected by inspectors and endorsed by Defra’s (2003a, 2003b) own animal welfare codes of practice. Additional effort was needed:

“We do keep, we do know what has died on farm, and calves and cows and whatever is gone, but it’s hard to get the information in the movement book. It’s all there, but it takes time to find out every cow that died from this November to last November; it would take me a good hour, sitting down to go through it all” (F4).

The format of the movement and other records often used to derive mortality often excluded key information, such as age or location of death. It also requires considerable collating and re-organising to support such an analysis. But beyond all the additional effort required to rework their records to support a more anticipatory analysis of mortality, there are at least two reasons why farmers were not acting on their mortality records as regulators imagined that they would and should.

First, while farmers were actively committed to trying to keep their animals alive and well, they also tended to accept a certain level of death as unavoidable on a farm. As long as mortality levels were low, farmers were not that interested in explaining their causes. A number of informants made statements similar to a stockperson who explained that at that farm they do not get “too uptight about reasons for it when it’s at that level” (SP8). Death was accepted as normal. Given all of the other things that needed doing, analysing mortality records was not a management priority unless it seemed high or was rising unusually. As one farmer explained:

“because we do have a very low level of mortality, it’s not very important to us, so it’s not something I continually chase” (F14).

While inspectors might retort that there is no way of knowing if the level of mortality is indeed low without doing the analysis, farmers were comfortable making that judgment intuitively without bothering to analyse the records. Farmers worked hard to avoid deaths but analysing records and calculating mortality rates was not the way to do so. For farmers and stockpeople, the purpose of the records was proving to *other* people what they already knew intuitively from their daily interactions with their livestock.

Second, death is not only accepted by farmers as normal on a farm; it is also very difficult to account for. On pig farms, even counting losses is difficult:

“Piglet losses is a difficult one. They’re outdoors, they get lost in the straw, yes, and we don’t know who died” (F15).

Farmers were conscious that disturbing post-partum sows to count their piglets and thereby get better data might actually increase mortality. Counting dead calves was less problematic as they are bigger, born in smaller litters, and not liable to being eaten by their mothers like dead piglets. But identifying the causes of death in cows was no less difficult, as this dairy farmer explained:

“Mortality is a difficult one in cows because it does go in trends but you can’t often find out why” (F10).

Pig farmers also find explanation elusive:

“We know in most of our herds that it’s either going to be a small pig, a death unexplained... unexplained are over half ... a lot of deaths are unexplained” (SP8).

More fundamentally, farmers did not see the value in mortality analysis. Explaining the causes of death *ex post* seemed beside the point:

“we can give ourselves a culling rate ... but if an animal dies it’s no good analysing it. It’s dead ... Here, where the problem was bad, we had a day like today [it was a cold, wet and windy day]. The year before, we had an easterly wind blowing and it was lovely and dry and the animals would get plenty of air. What can you do about it?” (F5).

This farmer was not uncaring. S/he saw no point in looking back because causes of death seemed so seemingly capricious and difficult to prevent. This sense of relative impotence in the face of death was often echoed by other farmers and stockpersons:

“It could be unfortunate, we just had a couple of animals die because we sort of got a little bit of pneumonia in there or, you know, or just a couple

of cows died during calving, and there's nothing much you can do about that" (F6).

Death was often seen by farmers as a matter of bad luck that sometimes escaped their best efforts to care for their animals. Death might be counted and recorded after the fact, but record-keeping was not seen as an integral part of farm strategies for managing illness and preventing mortality. Accordingly farmers saw the work that was required to account for animal mortality as burdensome paperwork and not an integral part of animal welfare practice. On those occasions when mortality records were analysed it was not to inform husbandry practices but to forecast milk yields and buy replacement livestock. This de-coupling of animal welfare paperwork from practice was even more noticeable in the case of medicine records.

Recording medicine usage

In addition to mortality records, WOFAR also requires farmers to keep a record of "any medicinal treatment given to animals". This demand is directly transposed from the Animal Welfare Directive (98/58/EC). As with the mortality records, the Directive promised to minimize the administrative burdens of keeping medicine records and making them available for animal welfare inspection by repurposing a host of already existing EU requirements for the recording of this information to assure compliance with a host of other regulations controlling the use of special or prohibited substances in animal husbandry (Regulation 85/649/EEC), classifying organic farms (Regulation EEC/2092/91), and preventing product residues entering the food chain (Council Directive 96/23/EC).

The fact that, as Defra (2013c) notes, medicine use records figure in 8 types of official inspections carried out by 5 different government agencies speaks to processes of regulatory expansion and audit colonization highlighted by Power (1997). While the Animal Welfare Directive (98/58/EC) simply requires records be kept for at least three years, without specifying further details about what should be recorded or how, animal health and food safety regulations are more exacting to enable regulators to trace contamination back to its source. To satisfy the Animals and Animal Products (Examination for Residues and Maximum Residue Limits) Regulations of 1997, farmers must record the name and address of the supplier and details of the date, dosage, person administering the medicine, and the identity of the animal(s) treated. Assembling these records implies keeping purchase and delivery invoices, veterinary prescriptions, batch numbers, medicine stock details and animal identification records.

Inspectors look closely at these medicine records. Inspector guidance specifies that they "should ask to see any medicines and product invoices present on the farm and be satisfied that their use is being recorded" (AHVLA, 2014). Verifying the existence and accuracy of these records is required for assessing compliance not just with animal welfare

standards, but also with other statutory management requirements for food safety and animal health. Again, it is the immutability of the paperwork that allows it to be mobilized to speak, unchanged, to such a multiplicity of regulatory purposes. While the original purpose of medicine records had been to enable the farmer to “demonstrate to the assessor that ... withdrawal periods are met before an animal goes to slaughter or their milk is used” (I4), those same records are now also being used to assess animal welfare. As I6 explained:

“The only way for us to know if the farmer is doing a good job is seeing that he is doing a lot of treatments...If he doesn’t keep the records, we don’t know.”

The value of medicine records as a welfare indicator was frequently highlighted by inspectors. A quick scan of the records could reveal whether there have been any animal health problems and if the farmer has been providing appropriate medical care for them. “The medicine records for me are an indication that the animals are receiving a level of care, whether that’s preventative or reactive”, explained I5. Inspectors related how much they could glean about welfare standards from the wear and tear on the medicine book itself:

“It’s very interesting to see that sometimes the medicine book is written all in the same colour pen. I did one visit and it was all written in a silver pen. Different dates. And I said do you always use a silver pen to write your medicine record with? But it was very clear that he had just written it in quickly the day before. He might have had it in other little pieces of paper” (I6).

While animal welfare inspectors themselves use the records for auditing compliance with the record-keeping requirements themselves and to inform their wider judgements about whether farmers were meeting welfare standards, this is not what inspectors understand their true purpose to be. Rather than providing an audit trail for external inspection, medicine records are framed by animal welfare inspectors as an essential tool for farmers themselves to use in improving animal welfare and productivity. As one inspector explained, without keeping and analysing their medicine records, farmers

“cannot work on reducing [their] medicines bill if [they] don’t know what [they’re] actually giving the medicines for” (I1).

Official guidance for farmers from Defra’s Veterinary Medicines Directorate (VMD, 2014, page 8) also emphasized “that it may be in your commercial interest” to keep and use medicines records.

At the herd level, epidemiological analysis of the medicines records can help farmers prevent recurring problems by identifying whether they are “typically seeing spikes in sort of respiratory disease in autumn and spring” (I2), for example. At the individual animal level,

inspectors expected that medicine records would also help the farmer decide when to end the suffering of an animal unlikely ever to recover.

Farmers, however, understood the practice of animal husbandry and the place of record-keeping within it in some different ways. Rather than awaiting an analysis of the records to tell him what to do, one dairy farmer insisted that he would know right away:

“I’m quicker than that, so if I’ve got a sheet [the hand written report produced by the stock staff after inspecting the animals] and every other cow with digital dermatitis, I would be going down today to try and investigate why ... I don’t wait until next month [when the medicine use records written by the stockperson reach him/her] to analyse it” (F7).

In other words, farmers discover problems through their daily practices of care not by analysing records. Similarly, it is not records but good stockmanship that lets the farmer know whether an animal is recovering. This, in turn, was understood as involving a direct relationship with the animal, a form of everyday interaction that past research has also highlighted as being central to farmer understandings of both animal welfare and of what it means to be a farmer (Singleton, 2012). The farmers and stockpersons interviewed look to their animals, rather than their records about them, when deciding whether to cull the sick:

“either I give her an antibiotic and she gets over it or she’s out. And then I’ve got to make a decision. It’s quite straightforward. Is she fit to walk up the back of the lorry on four legs and if she’s not, bang, that’s it” (F3).

So, at the individual level, stockmanship prevails over the kind of record-based, scientific analysis idealised by veterinary experts and animal welfare inspectors.

Even if farmers were inclined to use their records in that way, their physical form tended to inhibit epidemiological analysis. Many farmers kept daybooks and farm diaries in which they recorded information about medicine usage, but the chronological structure of these record books made it difficult to pick out information either about individual animals or the herd as a whole. Nor were the templates offered by farm assurance schemes for recording medicine usage much better. They were typically focused on accounting for the types and total volumes of medicines used, their sources, dates of purchase, and safe disposal in order to ensure the traceability of veterinary medicine products, and account for withdrawal periods and meet food safety requirements. This, of course, is precisely the information about medicine usage that farmers are required to record in order to comply with Article 10 of the European Directive (96/23/EC) on medicine residues in animal products. While the Directive is permissive about the medium in which that information is recorded –medicine records can be kept on paper, electronically or any other durable medium– there is no flexibility about the units of account or data fields that must be recorded. In order to protect the safety of the human food chain, farmers are required to

record each time they administer any veterinary medicine so as to ensure appropriate withdrawal periods are observed and account both for the medicines themselves and their traces in the food chain. These records provide a chronology of medicine usage and disposal from which it is extremely difficult to extract information medical histories of individual animals or the prevalence of particular diseases in the herd. As such the records designed to satisfy food safety regulations but also required by Annex 1 of the EU Animal Welfare Directive (98/58/EC) are unsuited to analysing animal care at either the individual or herd level. As F17 put it, “that’s the thing we don’t have on the records; we don’t have her past treatment record.” The existing templates for recording medicine usage were useful for showing regulatory compliance, but not much else. As one farmer explained:

“if you want to use them as a management tool they are no good, they’re no good” (F10).

This mismatch between the demands of regulatory reporting and animal care was also acknowledged by some inspectors:

“The reason the medicine books were set up as they are is just really following what the veterinary medicine regulations say: you need to keep the name or identification of the animal, what you gave it, when you gave it, withdrawal period. Because that is the law. It’s not really done in a way that facilitates interpretation or monitoring of an animal. If farmers recorded everything more appropriately, such as weight of the animal or reason for treatment, they would see the value of the record instead of just recording what they need to record by law and getting annoyed with the fact that they’ve got to record something on a bit of paper” (I1).

This inspector worried that record-keeping is decoupled from the wider goal of welfare. While farmers may do the paperwork to comply with the record-keeping requirements, keeping those records does not inform farm practice and serves no purpose other than demonstrating compliance. As critics of audit have suggested in other contexts (Power, 1997; Strathern, 2000), keeping records has become an end in itself rather than the management tool envisaged by animal welfare experts (FAWC, 2011; Main et al., 2014).

Farmers and stockpersons were quite upfront about this:

“The actual writing of the medication down, the batch numbers, the lot numbers, the withdrawal periods, for me personally is meaningless, you know, that’s just so I can get my farmer... well first all I want it to be legal and I want to be legal for the farm assurance” (SP8)

Record keeping was personally meaningless for this stockperson, because it was only about proving to certifiers and regulators that they were legal. The paperwork showed compliance, but did nothing else to inform farm practice or animal care.

Sometimes the paperwork that *was* useful for farming was not sufficient to show compliance, without additional work to make it so. One farmer kept detailed records to monitor causes and treatments of cattle lameness but not in the medicines book that s/he was required to keep by the farm assurance scheme. Instead s/he had a separate software package that s/he used to record the incidence of the different causes of lameness (ulcers, disease and various infections), individual cow histories of lameness as well as details of the location of affected cows so as to establish possible links to specific sheds. While these records were useful for farm management, they were not what s/he use to show compliance. To meet those requirements, the farmer had to do more work preparing *other* records in other formats. As s/he explained

“for farm assurance I then go and write another piece of paper because the farm assurance is coming and I make it up and I hand to them because ... they want to know how many cows you’ve got lame in one year. Well I don’t know how many cows I’ve had lame, that’s not really the point” (F10)

Rather, for this farmer, the point of keeping medicines records was satisfying the regulators. Caring for lame animals was something else entirely, as the reactions to the Farm Health Plan show quite clearly.

Farm Health & Welfare Plans

Whereas keeping mortality and medicine use records is legally required by EU Directive, Farm Health Plans (FHPs) are a voluntary instrument, first developed in the 1980s, and only later introduced officially into Defra's Codes of Practice for Pigs and Dairy Cows (Defra 2003a, 2003b). Despite these differences in origin and legal status, the FHPs show a similar plasticity in their regulatory purpose. Defra first promoted them as animal health and biosecurity tools in two advisory pamphlets published in the wake of the 2001 foot and mouth outbreak (Defra, 2001a, 2001b). In this context FHPs were all about “keeping disease out of farms”, though Defra (2001b, page 2) also noted that “in the future [they] will become an important part of the ‘Farm to Fork’ approach to ensuring food safety.” There was no reference to animal welfare.

Over the next few years, FHPs were recast as self-regulatory instruments for improving animal welfare. Defra’s (2003, page 6) Codes of Recommendations for the Welfare of Cattle and Pigs respectively urged farmers to:

“draw up a written health and welfare plan with the herd’s vet... You should review and update your health and welfare plan at least once a year. The plan should set out health and husbandry activities that cover the cycle of production and include strategies to prevent, treat or limit existing disease problems. The plan should include enough records to enable you to monitor and assess the health and welfare of the herd.”

The Codes refer to FHPs 9 times in all, providing extensive detail about what issues they “should, as a minimum, look at” (page 10) as well as instructions for how farmers should use them as part of a “thorough assessment and planned approach” (page 23) to animal welfare. In this way FHPs reinforced the analytical framing of the records described in the last two sections while setting out an overarching ‘behavioural script’ (Akrich, 1992) for farmers to follow in using them, based on ex-ante planning and target-setting, progress monitoring and recording, and adaptive management. To deliver the “longer term culture change whereby FHP become a routine feature of livestock management”, Defra spent nearly £3 million promoting FHPs as a more “proactive” approach for improving animal welfare and for “making animal keepers work closely with vets... to set targets for health and welfare and to measure, manage, and monitor productivity” (Osmond, 2009, paragraph 1.4, 1.6).

Given the very prominent role they accorded to veterinarians, it is not surprising that all the inspectors interviewed thought highly of FHPs, which the veterinary profession regards as best practice (Main et.al 2014). Echoing the anticipatory vision of good husbandry advocated by the Codes, one inspector explained how the FHP would help farmers take a more proactive and analytical approach to animal welfare:

“that plan is not just about ‘I’m going to get these pigs vaccinated at this age’. It’s about ‘I’m going to monitor the health and welfare of these animals’ and ‘I’m going to keep records’” (I1).

This view of FHPs as beneficial for the farmer was universal among the inspectors interviewed for this study:

“most of the records we require are because we think that there is actually a benefit to the farmer for having them, so something like their health plan, we think that’s actually a benefit for the business to have it documented, clearly explaining all the processes” (I5)

But inspectors also conceded that farmers did not often see it that way, and inspectors worked hard during inspections to “make them understand that it is useful for them” (I4).

Although FHPs were not something they were required to check as part of any cross-compliance or animal welfare inspections, inspectors liked to see them anyway. Their presence was taken as a sign the farmer is meeting required animal welfare standards. As one inspector explained:

“if you’ve got very good up to date well completed records, the rule of thumb, the farm is quite good and you wouldn’t expect there to be major welfare problems” (I2)

The FHP provided inspectors with tangible proof that the farmer had complied with the Codes’ recommendation that s/he “should demonstrate caring and responsible planning

and management” (Defra, 2003, page 2). However, those caring and planning processes that the physical FHP stood for necessarily escaped direct inspection. Expert veterinary inspectors might look at the condition of the animals on the day as part of their visit, but if they wanted to know about how animals had been treated in the past or how farmers might deal with any future problems, all they could ever do was to audit the paperwork:

“they’ve got to have a proactive approach to health planning. That is normally demonstrated by them having a documented health plan” (I4).

Inspectors were acutely aware of this slippage and tried to bridge the gap between farm paperwork and practice through careful questioning and expert judgment:

“the assessors, they are looking for a copy of the document on file, but I suppose in absence of the document they would be asking... well, and even when the document’s there, asking about what do they do on farm to limit different issues, and they might ask that before they even look at the document, but they might look at the document afterwards and check that it links up with what the farmer’s saying” (I3)

While it was possible to have an animal welfare plan without putting it to paper, assurance and audit required paperwork to prove that planning has been done and “demonstrate that the farmer is proactively thinking about what they can do to manage potential problems on their farm” (I4).

The tangible FHP document served other purposes that the planning processes it was recording could not. If an on-site visit were to uncover poor welfare outcomes, the existence of the FHP was an important mitigating factor shaping inspector judgments about whether the farmer had violated WOFAR. As one inspector explained:

“even if they've got a massive problem, if they've got 30% lameness, there's evidence that they are doing something about it” (I1)

Seeing the FHP, inspectors were more likely to judge farmers as compliant with the WOFAR duty to take “all reasonable steps to ensure” animal welfare. In the event of a criminal prosecution, the existence of the FHP also played an important role in a farmer’s legal defence. Under the Animal Welfare Act 2006 S14(4b), compliance with a relevant provision of the Codes, such as the recommendations about having a FHP, “may be relied upon as tending to negative liability.” Such a ‘due diligence’ defence required FHP paperwork to record what the farmer had done to satisfy the reasonableness duty of the statute.

Farmers readily acknowledged the value of the FHP as a physical record. As F11 explained, “it’s just writing down what we should be doing anyway, you know... it’s just sitting down and formalising what we’re doing, really...”. Similarly F9 said, “all it is doing is recording what we do anyway”. For many farmers, this accounting process was entirely externalized, as something “done by the vet”, so much so, in fact, that farmers sometimes

struggled to say what—and where— their FHP actually was when interviewed about them. F18 needed to be reminded by his stock manager that “it’s what [name of vet] sends us after s/he has been for a visit”, prompting F18 to exclaim, “Ah! A vet report!”. F17 was equally befuddled when asked about the FHP:

“Yes, well, the veterinary health plan, I think ... let me see ... [rummaging through the files] I don’t have a health plan here at the moment; I think it’s at home ... it might be at home ... that’ll be at home.”

This indifference is not surprising, since the FHP is not something farmers and stockperson are active in formulating. It is simply a collection of management protocols farmers are required to document. It was simply a record of the farm’s situation, gathering together into a single file all of the other records and management protocols farmers were required to document. Farmers described its function in terms of “backing up”, “confirming” and providing a “historical picture”.

As such the FHP is something to be filed away, rather than actively used in day-to-day decision-making or future planning as Defra (2003) and veterinary inspectors expected it should. “Most of the stuff is what we’re doing anyhow” is how F8 put it. Asked if s/he ever used the FHP him/herself, F17 replied:

“No. It’s just another thing that we have to keep – another item of paperwork, like all the other paperwork that we have to keep for so many years”

This was a universal view among all 25 farmers and stock-keepers interviewed. The FHP was a document that was only produced for compliance purposes:

“To show my farm assurance man when he comes around every year, show I’ve got one” (F15)

Complying with those external demands required producing a piece of paper rather than actually using it for anything else. Indeed quite often farmers would pay their vet to write their FHP, which would then sit on the shelf until the inspector came by to look at it.

As a result the FHP tended both to lag behind and to drift away from the care practices it was supposed to inform and assure. Farmers completed their paperwork in fits and starts around the edges of their daily farm work. Daily farm work took priority, and keeping FHPs up-to-date was a constant challenge. When farmers sat down to do their paperwork there was then the challenge of reconstructing a coherent account of what had been done from the various notebooks, receipts, and other files in which activities on the farm were recorded. It was those records that formed the reference point for updating the FHP rather than the actual practices it was supposed to be informing *ex ante*. In turn since inspectors looked at the FHP paperwork rather than any planning that might have gone into

it, if discrepancies arose between what was recorded and what was recalled, it was the paperwork that would prevail over any actual planning. As one inspector explained,

“when you're talking to them, they will all say that they are doing something but if they have written it down on a piece of paper, that's another matter. They always say it's all in my head. I don't need to do it. And I say, well, you do need to show me on record” (I4).

This tendency for audit processes to become de-coupled from the practices they are supposed to control is now well documented (Power, 1997; Strathern, 2000), though it has typically been explained in terms of institutional incentives to game compliance processes and manage blame (Bevan and Hood, 2006; Huber and Rothstein, 2013), rather than the materiality of the paperwork involved in assembling the records themselves.

This decoupling of farm paperwork and practice was also driven by farmers' understandings of good animal husbandry (Burton, 2004). Such ideals clearly vary—historical, national, sectorial, and farm-size variations are all well documented in the literature (Demeritt, 1995; Silvasti, 2003; Haggerty *et al.*, 2009; McGuire *et al.*, 2012). Nevertheless the 25 farmers we interviewed were unanimous in seeing no practical use for the FHP. Rather than looking to their FHPs or other records to help them anticipate animal welfare problems and figure out how to manage them, farmers defined stockmanship as the ability to do that intuitively. As F25 explained:

“You don't go back and look at patterns because you see patterns as you go through really.”

Good animal husbandry was all about anticipating problems and dealing with them before they ever show up in the records. F13 was effusive on this point:

The stockman, if he's worth his money, knows if things are right, or if things are not right ... by what he sees, what he smells, what he hears ... Forget about tick box recording. How are you going to record 100 pigs in the pen, and how many scratches they've got?

Farmers and stockpersons believed that records were no substitute for good stockmanship, which they defined in terms of the intuition and skill needed to sniff out and eradicate trouble before it escalated. By contrast recording-keeping was inevitably retrospective in its orientation, and so could only ever detect problems after the farmer had already dealt with them, when it wasn't focused on recording the wrong things altogether.

Farmers' own records

While farmers were not convinced of the usefulness of the mortality, medicine use and farm health plans records they were expected to keep for audit and assurance, they were keen to explain how their own records were much more useful and how they were more judicious

about keeping them. It wasn't, farmers insisted, that they were inherently uninterested in record-keeping; rather, they perceived a mismatch between what was audited externally and what was actually useful for their own internal purposes:

“the ones that matter to us is (sic) the more important, but very little importance to the inspectors and vice versa: the ones they check it's (sic) not really important to us” (F17)

This was a near universal perception, echoed here by another farmer:

“It's stuff that we're asked to do that we don't really use, but it's all stuff that we do do that is not required” (F2)

Despite the promise of the Welfare Directive (98/58/EC) that farmers could satisfy record-keeping requirements with “equivalent information... kept for other purposes” and the absence of any statutory requirements for particular record formats, farmers consistently perceived that the records they themselves found most useful were not the ones that inspectors would regard as sufficient for demonstrating compliance.

From a business management angle, the most useful records were those that helped farmers monitor income and operational costs. For example records of how much milk is dumped due to mastitis or its treatment were important to work out potential milk production as well as the revenue cost of prevalent mastitis. In addition to recording profit and loss, farmers also kept and used records to help them monitor two other aspects of their farm operations.

The first was productivity, which farmers monitored at both the herd and individual levels. At the herd level, recording information such as rates and timespans of food conversion, milk yields and total numbers of piglets born and weaned was useful in order to benchmark and improve the productivity of the herd. For example, one pig farmer kept records that showed that s/he had managed to shorten the number of days it took to get pigs to the desired weight. Records that reflected changes in productivity were good to keep “because good production drives good profits” (F1). Analysis of productivity records was also an important driver for changes in farm management to improve performance and profitability. Another farmer explained how the desire to increase the number of piglets weaned had led to changes in the structure of sow pens and how they were eager to keep records as a driver for continued improvement:

“a couple of years ago we were only weaning 11.3 - 11.4 [piglets per sow per cycle] and then we got these rescue decks and that meant that we could wean more; we had more space. So now it's up to 12 ... and in time the national records will go up a bit and if we want to be better, we've got to be 12.5” (F25)

Likewise, farmers also recorded information to help them manage and plan farm budgets. Records on the number and dates of calvings helped estimate fluctuations in milk yield and thus farm income. Records tied to the bottom line were universally recognized by farmers as important to keep.

Productivity records were also kept and monitored at the individual level in order to inform animal management. Recording the numbers of piglets born and weaned by each sow and correlating those data to her number of litters was useful for designing culling protocols (always cull after the seventh litter for example) or identifying which individual sows to cull, which ones to breed sow replacements from and which sows to foster piglets onto. Records of individual cow milk yield were important for making decisions about how much food to give them. Conception records of both sows and cows were important, because animals that fail to get pregnant are animals that cost money without returning a profit. At both levels, the relationship between the data and management decisions was straightforward, and this made those records useful for farmers.

Secondly, some farmers also maintained and used records to help them keep track of farm tasks and routines. Farmers kept records of whether and when tasks like servicing had been performed in order to plan chores such as building farrowing huts or moving animals into other pens for calving or farrowing. Records that helped locate individual animals in a stage of the production cycle were also useful. Records of calving difficulties were important to keep in order to be better prepared next time. Again, the relationship between the data and on-farm decision-making was evident too and this made these records useful for farmers.

Efforts to tap into farmers own record-keeping to reduce the administrative burdens associated with external assurance will face at least two challenges. First productivity records are not animal welfare records. While some of the productivity records kept by farmers also provide data on welfare issues such as lameness or mastitis, many other welfare indicators, such as tail-biting in the case of pigs, are not recorded by farmers. While important for animal welfare, such issues are not systematically recorded by farmers because they are not directly relevant to the sort of productivity decisions they keep their own records to inform.

Second, there is enormous heterogeneity in both the kinds of records farmers keep for themselves and the ways they keep them. Record-keeping practice varied substantially between the two sectors studied here, as well as varying according to specific farming practices in each. For instance, lameness is a different problem in different sectors; it is understood in different ways and leads to different decisions. So while repeated incidents of illness are often a reason to cull a dairy cow, this is not the situation in the pig sector. While a recurrently lame cow would not be a good cow to keep, on pig farms repeated lameness was not a reason to cull a sow:

“we don’t take into consideration whether we have to give her penicillin every time she farrows [or if] she always get mastitis” (F1).

Rather, lameness in sows was understood to denote poor husbandry:

“if we have to medicate them it’s our fault, not their fault” (F2)

As a result many pig farmers did not regard lameness as a problem that would necessarily lead to culling:

“I wouldn’t necessarily cull her on a treatment... I don’t always blame her, ... and I wouldn’t say yes, kill her because she’s had that treatment” (F17).

This view was echoed by other pig farmers:

“We don’t make any management decisions on how we medicate them” (F2).

While most pig farmers interviewed centralized all their paper records into a particular software package (Agrosoft) used by all but one of the pig farmers interviewed), the situation was very different in dairy farms. Milking parlours have their own software therefore there is greater variance in the software packages used by dairy farmers. These parlour software packages were also hard or impossible to use in conjunction with other farm management software options. Standardising the software used in dairy farms would thus appear to be very difficult. Furthermore, the amount of records and agents involved in their keeping was substantially higher in dairy farms. As one dairy farmer explained, this level of dispersion in records and support agents made record-keeping and analysis substantially harder in this sector:

“it’s assimilating all the information, isn’t it? It’s gathering all the information and putting it together. You know, we’ve got some information for the assurance, some information for the movement book, some information for the NMR [National Milk Records] ... information from the vet, from the foot trimmer, from the mobility scorer, the servicing person, QMMS [Quality Milk Management Services]... they are all in different places and not all go into one same system” (F4).

Moreover, in both sectors, insofar as decisions about what records to keep respond to, rather than drive farming practices, records are as varied as the latter. Hence standardising them for audit and animal welfare purposes is likely to be challenging. For example, when weight is a criterion for deciding when and where to move animals, recording it becomes important, but not all farmers operate in that way. Some farmers change rations (in quantity and composition) according to weight while others feed only one ration throughout a given animal’s development stage. Thus the former need weight records, while the latter need age records, and some farmers simply rely on an experienced eye to make such decisions. Similarly some farmers use artificial insemination, while others have boars that run freely with their sows. These different farming practices lead them to

keep and use different fertility and farrowing records. Variance in culling protocols implies disparities in records: if you cull at number of litters produced you need different records than if you cull on number of piglets born or weaned. Again, even if you cull on number of piglets born alive or weaned, your records will be different than if you give the sow only two breeding opportunities or if your protocol is to always replace four sows at every breeding season.

In sum, the records farmers keep are about animal productivity and task management and are useful to the farmer insofar as they fit neatly into decision-making. Farmers' own record-keeping practices vary substantially by sector and by individual farmer. This heterogeneity, combined with the mismatch between productivity records and welfare indicators, will make it challenging to devise consistent guidance for inspectors that might enable them to use farmers' own records to measure compliance with the law or with the requirements of the various different private assurance schemes.

5. DISCUSSION

While this research has highlighted some specific issues with each of the record-keeping requirements examined in this project, such as a certain tolerance of death in the case of mortality records, the findings also point to some more general insights about record-keeping and its relationship to animal welfare practice and regulation. In particular it highlighted consistent differences between farmers and regulators in how they understand and use animal welfare records. Those contrasts, in turn, reflect competing understandings of how 'good' animal husbandry should be practiced. These insights are drawn out at greater length in the discussion that follows.

One consistent finding from the research was that farmers and regulators think differently about the purpose of keeping animal welfare records. Regulators frame records as useful management tools for farmers and therefore perceive the regulatory requirement to keep them as light touch because they assume that farmers are already (or should be) keeping these records for their own management purposes. Far from imposing burdens, the requirement to keep records might, from their perspective, even be said to benefit farmers. Regulators believe that improvements in animal welfare can be driven by benchmarking performance and recording progress. They believe that monitoring animal welfare indicators will help farmers anticipate problems and manage them more effectively, if only farmers could be persuaded to use the records properly.

By contrast, farmers understand record-keeping requirements very differently. They understand the primary purpose of record-keeping to be about satisfying external accountability demands from government and private assurance schemes. While farmers do keep some records of their own, particularly related to farm productivity and work routines, for the most part paperwork is something they do to satisfy others. Consequently, they tend

to perceive record-keeping requirements as onerous, even if the need for records in order to maintain consumer confidence and control disease outbreaks is generally, if somewhat begrudgingly, accepted.

The research also highlighted important differences between farmers and regulators in how they used farm records. Despite their belief that animal welfare records were primarily management tools for the farmer, regulators themselves used them extensively to assess regulatory compliance (Roe et al., 2011). Without veterinary expertise, auditors from the RPA and private certifiers tend to define compliance simply in terms of the presence of the records and their internal consistency with other records (RPA, 2014). But even the more expert inspectors from the AHVLA use records in deciding whether animal welfare standards are being met. As well as verifying that record-keeping requirements had been met, AHVLA inspectors also scrutinize the quality of the farmers' paperwork in the belief that it is central to farm management and therefore provides a useful indicator of welfare conditions on farm and a proxy measure of managerial competence at meeting the required standards. In both respects, therefore, records are central to inspectors' judgments of regulatory compliance.

Farmers, in turn, understood this and organise their record-keeping practices around the demands of regulatory assurance. They do paperwork to satisfy the inspectors and meet the minimum legal requirements. Nevertheless, paperwork violations are still the most common breach recorded in random cross-compliance inspections on animal welfare in England.

This research has identified four intertwined reasons for such violations and for the more general reluctance of farmers to use their records for the sort of pro-active farm health planning recommended by veterinary experts as essential for animal welfare. First, farmers are sometimes ignorant of what record-keeping is required for the various different regulatory inspections to which they are subject, often confusing by-products and movement records with mortality records for example. Such confusion is perhaps understandable given the explicit allowance made by the Welfare Directive for satisfying its record-keeping requirements with "equivalent information ... kept for other purposes." While Defra (2014) has pledged to simplify the requirements and make compliance easier, non-compliance is likely to remain common as long as regulatory record-keeping remains such a low priority for farmers.

This is a second major driver of welfare record-keeping violations. For farmers the daily practices of looking after animals come first; recording them is understood as secondary, in the sense both of seeming less important and being done after the fact to corroborate and document for others what the farmer already knows to have been done. Paperwork is something farmers try to catch up with around the edges of their primary duties on the farm looking after their stock. As a result there is a tendency for on-farm

animal care to become decoupled from the paperwork generated afterwards to demonstrate compliance with animal welfare standards.

While this decoupling of audit from the qualities it is meant to assure is now a familiar staple of academic critique (Power, 1997; Strathern, 2000), scholars have not always been careful enough to distinguish the different forms it takes, which involve different drivers with different consequences. What Bromley and Powell (2012) call ‘policy-practice decoupling’, whereby formal policies are ignored in actual practice, is often attributed to strategic behaviour, such as calculated non-compliance (Braithwaite, 1982) and audit target manipulation (Bevan and Hood, 2006), or to institutional dynamics that normalise deviance and buffer organisational routines from external scrutiny (Vaughan, 1996). While farmers often ignore record-keeping requirements, we heard no reports of the sort of systematic gaming of audit controls that have plagued banking regulation (Miles, 2013), where huge incentives for noncompliance are countered by eye-watering fines for firms caught cheating. By contrast, in animal welfare the penalties for record-keeping violations are low—just a 3% reduction in CAP subsidy payment—as are the chances of detection, since barely 1% of farms are subject to random cross-compliance inspections. Thus, if record-keeping violations are common, such policy-practice decoupling results at least in part because farmers have few incentives to take the requirements more seriously. But even perfect paperwork is no guarantee of good animal welfare. The law simply requires farmers to keep records; they are not obligated to use them. As well as ‘policy-practice decoupling’, animal welfare regulation is also hampered by ‘means-ends decoupling’ whereby record-keeping requirements fail to achieve their goal of improving animal welfare.

Third, this means-ends decoupling of record-keeping requirements from the aims of animal welfare policy has been exacerbated by efforts to minimise the administrative burdens of regulation. Rather than devising bespoke assurance procedures, the Welfare Directive relies on auditing already existing records, which were designed for other purposes. As a result, their physical form is often unsuited for the sort of anticipatory analysis veterinary experts say is vital for improving welfare. For example farmers are required to record daily medicine usage and mortality. The resulting chronological records are difficult to use for cross-sectional analysis to detect herd-level trends in animal health and welfare, or for tracing the treatment history of individual animals. The lack of standard formats for mortality record-keeping leads to farmers using other records, such as movement records, to ascertain mortalities and comply with the requirements. However, movement records or end-of-rearing period records lack the information that would facilitate epidemiological analysis, such as age or location of deaths. Although the format required for medicine records is more detailed and exacting than what is required for mortality, it does not allow for epidemiological analysis of animal illness at the individual or herd level that would make those records useful for animal welfare. But despite their

unsuitability for its regulatory purposes, the Welfare Directive still requires farmers to keep mortality and medicine records.

But beyond the material barriers to using records highlighted by the STS focus on design and technology, there is a fourth reason that farmers have resisted Defra's efforts to promote the active use of records to drive improvements in animal welfare. In Akrich's (1992) STS terminology, that regulatory expectation reflects a particular *script* for farming that practicing farmers consistently reject. Whereas regulators associate record-keeping with good welfare, farmers insist that caring for animals and keeping records are two different and parallel practices. Rather than looking to records to anticipate potential welfare issues, farmers describe their ability to identify problems and deal with them as they arise as core skills of the good farmer. For them good animal husbandry depends on experience, intuition, and sensitivity; it involves looking, smelling and hearing, not analysis or record-keeping.

"Welfare is something that you relate to seeing that the animal is comfortable, well bedded, got freedom of movement, it's not got any lesions, no lameness and that type of thing" (F11. Respondents F2, F6, F13, F18 and F23 made the same claim)

While Defra (2003a, page 2) defines good practice in terms of auditability and demonstrating "responsible planning and management", farmers identify more closely with older definitions of professional husbandry as a tacit skill, articulated in the first Codes of practice, when "the good stockman [was expected to] know the signs which indicate good health ... recognise impending trouble in its earliest stages ... identify the cause and put matters right immediately" (MAFF 1969, page 2). These conflicting assumptions about record-keeping and good animal husbandry explain the resistance of farmers to Defra's efforts to promote the active use of farm health plans.

Significantly, while analysing the legally required records was not a practice integral to professional husbandry, several farmers had developed other records more closely related to stockmanship. For example, while arguing that welfare was not about records, this farmer was adamant that his/her records about the expertise and stability of his/her staff were a better indicator that the animals were being well-looked after; his response was echoed by several other farmers:

"We don't keep a lot of records that could prove to you our pigs are high welfare. I think the welfare of the pigs on any farm are down to the stockmen looking after the pigs and what I can do is show you how long the staff have been employed with me" (F13. Similar comments were made by F2, F6, F11, F18 and F25)

Moreover, this stockmanship approach to welfare has led other farmers to develop records to monitor stockmanship and make management decisions. One has designed a

record-keeping sheet with a section for staff to note their moods. Aware that chores like artificial insemination, for example, require a calm and affable disposition, these notes help allocate jobs: staff on a bad day are given other tasks and receive managerial support. Another will use records (number of pigs weaned or sold for example) to decide on a financial bonus for their staff. In other words, useful records to ensure and improve animal welfare are records that indicate adequate and expert stockmanship.

To be sure, while regulators understand record-keeping as management and good husbandry as anticipatory planning, measuring and monitoring, farmers understand record-keeping as compliance and good husbandry as looking after the animals, knowing them and being able to recognise when something is wrong and acting on it immediately. Whereas for regulators record-keeping is at the heart of 'good' husbandry, for farmers, caring after animals and keeping records are two different and parallel practices.

6. POLICY IMPLICATIONS AND POSSIBLE NEXT STEPS

At the beginning of this project two very clear puzzles were troubling the Animal Welfare Directorate: why are farmers not using the records they must keep? How can Defra make farmers understand that they are not being asked to do anything different to what they should be doing anyway?

In response to the first question, the findings of this project suggest that farmers do not use the records they must keep because the expectation that they do so makes assumptions that are not aligned with how the records and farmers operate in practice. The assumption that the records provide information on which to better understand death and illness is not materialised in the format of the records themselves. The assumption that farmers need records in order to identify and resolve problems does not fit with farmers' practices and ideas of the skills involved in 'good' husbandry.

This study suggests that regulators' views of the purpose of record-keeping requirements are not sufficiently informed by an understanding of farmers' own ideas and practices. This research has highlighted the importance of farmers' ideals of good animal husbandry in shaping their responses to regulation and shown that they stand in contrast to regulators' ideas about the practices that constitute 'good' husbandry. Plans to reduce unnecessary administrative burdens and align EU record-keeping requirements with opportunities for improved animal welfare practice would benefit from an improved understanding of the farmers and farm practices they are trying to influence.

This project points to several possible next steps to address the issues highlighted in this report. First, the on-going work in updating Defra's Codes of Recommendations may provide a suitable opportunity to engage with farmers in a dialogue to develop greater

consensus among regulators, farmers, and animal welfare advocates about both the practices that constitute 'good' husbandry and the role of record-keeping within them. This dialogue would need to consider how best to assess and measure 'good' husbandry. Perhaps the format of the current records could be improved so that their potential usefulness was more apparent to farmers. But it could also be that there are other records that offer a better indication of good stockmanship; or it may be that the consensus is that records are not good indicators of caring for animals' welfare and that alternative approaches to assurance are required. What is clear from this research is that there are important gaps between the material records themselves and the underlying qualities they are meant to ensure: while the physical presence of mortality, medicine and FHPs documents is enough to show compliance with the requirement to keep them, their ability to speak for standards of animal welfare is indirect. Given the decoupling of record-keeping from farming practice, more outcome focused, 'show me, tell me' styles of animal welfare inspection may provide an assurance mechanism better aligned with farmers' own understandings of good practice than the current system of cross-compliance audits required by the EU. However, directly assessing the health and welfare of farmed animals requires more expertise than auditing paperwork and so would be more costly to implement. Compliance judgments would also depend to a greater degree on individual inspector discretion, which can create uncertainties among regulatees about whether they are compliant. In 'show me, tell me' inspections compliance is more judgemental than in tick-box inspections and what may satisfy one inspector may not be enough for another one; homogenising compliance criteria would be harder for regulators and discrepancies would be confusing for farmers. While the current system is unpopular with farmers, it is not clear that the alternatives would be any more so. Thus in addition to more engagement with farmers, further research on inspection and enforcement practice would be needed to identify and assess possible innovations to inspection regimes. The on-going work on further developing outcomes-based assessments of animal welfare might offer an innovative context in which to work towards a better alignment between the records that are required and the basic aims they are supposed to achieve.

Second, in keeping with the open-policymaking agenda, there may also be opportunities to engage with farm industry groups, private assurance scheme operators, and software designers to develop harmonized IT solutions that would enable farmers to satisfy various sector-specific record-keeping requirements more efficiently and in ways that could support more convenient analysis of EU-required records to improve animal welfare. This process would need to understand sectorial differences in farming and record-keeping practices better: what records are more useful for each sector? How do sectors differ from each other in terms of their capabilities to collect and analyse records? Likewise, the process would also need to establish how software designers and agricultural analysis companies incorporate welfare issues. For example, in the cases examined in this research, welfare issues were

recorded under the “Comments” section but were not linked to animal productivity or farm performance. Maybe software designers could help make the relationship between welfare and profit more apparent for farmers.

Third, there may be opportunities to engage with farm industry groups, private assurance scheme operators, and animal welfare NGOs to explore the potential for redesigning farm health planning guidance in ways that might better meet the specific needs of farmers for the different sectors. Such open-policy making might help increase the uptake and use of farm health plans. In previous research, the author noted the emphasis of current FHP guidance on animal health elements (Escobar and Buller 2014). Part of the redesign effort could seek to make animal welfare elements more visible within the guidance. However, it could also be the case that readdressing the focus of FHP on health and biosecurity issues made their usefulness and specificity more apparent to farmers, while the aim of driving improvements to animal welfare may be better served by other tools as described in the first point.

In response to the second question it is clear that the expectation that farmers should be using the legally required records because they are already keeping them is unaware of the additional work and the difficulties that using the records implies. Making the records useful requires additional work and support; how much more work and support seems to vary by sector. It is also clear that there are tensions between the work that the records do for those who keep them and the work they do for those who audit them. It is also clear that the records can become de-coupled from what they are meant to measure. It is also clear that while farmers are able to tell which records they need to keep for each of their auditors, be that from the public or private sector, in the end regulation is regulation. This suggests several questions that could support efforts to improve regulatory effectiveness and identify unnecessary burdens on agriculture: what work is implied in keeping this record? What work and for whom is this record making? what is the record really measuring? Does the record’s format facilitate analysis? Is support for analysis available?

These policy steps would benefit from further research on sector-specific practices of record-keeping and the variability and effectiveness of different inspection and enforcement practices.

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