

Public perceptions of undercover investigations in livestock farming: An end that justifies the means?

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Abstract

Secretly taken photographs of livestock production systems, representing animal welfare violations, regularly appear in the media and initiate discussions as to the legitimacy of overriding legal regulations in order to document animal welfare standards. This paper focuses on the public perspective and compares different forms of undercover investigation, weighing animal welfare against the invasion of farmers' privacy. For this purpose, an exploratory online survey was conducted in Germany (n = 292). Participants were carefully selected to ensure that age range, education level and sex reflected the distribution of the society as a whole. In a split-sample survey, each participant was confronted with three scenarios. The scenarios were mapped using pictures showing various levels of farm conditions combined with small information segments describing the invasion of farmers' privacy. Participants evaluated the scenarios for their perceived legitimacy and whether entering the premises should be punished. All forms of undercover investigation were perceived as legitimate by most respondents. Perceived legitimacy was considerably higher when obvious animal abuse was uncovered. Apart from where damage to property was involved, which was mostly considered as unacceptable, harsher punishment for animal welfare organisations generally obtained little social approval. The public's increasing awareness of farm animal welfare overruled social norms regarding farmers' privacy, and thereby demonstrated the importance of animal welfare in society. Approval of undercover investigations indicated that changes in housing and handling conditions as well as improvement in control mechanisms are necessary to increase animal welfare and thus public acceptance of livestock production.

Keywords: animal welfare, livestock production, pigs, secret pictures, undercover investigation, whistle-blowing

Introduction

In recent years, the media has repeatedly released undercover investigations showing injured or sick animals as well as improper housing and handling conditions on farms (eg Animal Recovery Mission [ARM] 2019; NBC 2019).

In the United States, the idea of 'whistle-blowing' is widespread. There, most undercover investigations are conducted by animal welfare activists who work at farms under false pretences to document housing and handling conditions (Associated Press 2017). Under strong pressure from the US livestock industry, special laws (so-called 'ag-gag' laws) have been introduced during recent years, making undercover investigations a punishable offence (Shea 2014). More than half of US states have already introduced ag-gag laws (Marceau 2015), but fewer than ten have actually enacted such laws and some accuse ag-gag laws of being unconstitutional since they violate the right of freedom of speech (American Society for the Prevention of Cruelty to Animals [ASPCA] 2019).

In contrast, in Europe, animal welfare organisations mostly access premises at night without farmers' knowledge (Deter 2017). Resultant damage to property is sometimes accepted as necessary to force the intrusion (Lenfers 2019). Additionally, media reports are often supported by interviews with employees describing the abuse from their perspective (eg FAKT 2019). To date, no ag-gag laws have been introduced in Europe. However, in Germany, the first political attempts to introduce harsher punishment for animal welfare activists have been observed. Nevertheless, the handling of undercover investigations remains controversial and is the subject of fierce debate.

The livestock industry, as the main opponent of undercover investigations, argue against hidden camera observations. They complain that emotionally loaded footage of the 'black sheep' may be assumed to apply to the entire industry. In addition, released material showing standard practices, such as tail docking, might lead to social loss of acceptance of these production methods (Johnson 2014).

The social perception of undercover investigations in livestock production systems and their legal handling are poorly investigated. Today, a growing part of the population is increasingly interested in more information and transparency about livestock and food production (Feldmann & Hamm 2015; Caracciolo *et al* 2016). As modern livestock production allows only limited access for hygienic reasons, information is mainly obtained through mass media, and the widespread negative reporting by animal welfare organisations serves as a primary source of information for a large proportion of consumers (Cornish *et al* 2016). It can be assumed that the emotionally loaded material is in line with the public's critical perception of modern livestock production (Clark *et al* 2017). Previous studies from Tiplady *et al* (2013, 2015) in Australia as well as results from Liebe *et al* (2017) and Schulze *et al* (2018) in Germany confirm this assumption and found social approval for undercover investigations aiming to reveal livestock abuse. Findings from a poll in the United States reinforce this positive attitude and accordingly found that harsher punishment of undercover investigations is rejected by most US consumers (ASPCA 2012). In 2016, Robbins *et al* concentrated more deeply on the public perception of ag-gag laws in the United States and concluded that knowledge about these laws decreases trust in farmers and leads to a more negative perception of farm animal welfare. Only one publication has examined the conflict between the possibility of uncovering animal abuse and the invasion of privacy that accompanies secretly taken footage (Liebe *et al* 2017). Based on a factorial survey design, the authors concluded that undercover investigations get less public approval if animal welfare activists damage property, such as spray graffiti on the wall or free animals. However, Liebe *et al* (2017) neither examined how animal welfare activists entered the farm nor whether animal abuse was uncovered or not.

Our study bridged this research gap by examining different forms of undercover investigations. Thus, it contributes to a deeper understanding of the public approval for the above described diversity of undercover investigations. Results from this study could help to align farmers' and society's expectations of animal welfare in livestock production. In the long run this could lead to a transformation of livestock production that includes the public's interest in farm animal welfare.

The main objective of this study was to investigate perceived legitimacy and perceived need for punishment for different forms of undercover investigation. The following research questions were examined:

Q1a: Does the socially perceived legitimacy (Q1b: the socially perceived need for punishment) of undercover investigations vary, depending on how the animal rights activist has gained access to the animals?

Q2a: Does the socially perceived legitimacy (Q2b: the socially perceived need for punishment) vary, depending on whether obvious animal abuse has been discovered?

Materials and methods

In April 2017, an exploratory online survey with the help of a professional online access panel provider was conducted in Germany. Participants were carefully selected to ensure that age, education level and sex reflected the distribution of the society as a whole. In addition to providing socio-demographic information, the participants were presented with different scenarios of how an undercover investigation could possibly be carried out. This study focused on common forms of undercover investigation in Europe, excluding new forms of 'whistle-blowing' recognised in the United States.

Derived from recent undercover investigations, scenarios developed for this study differed in whether animal abuse was uncovered and how the animal welfare organisation gained access. Figure 1 provides an overview of the scenarios examined.

A scenario consisted of a picture, representing farm conditions, and a short description providing information on the form of invasion of farmers' privacy. The first picture showed obvious adverse conditions for the animal, and the second suggested a possible lack of living space. Both pictures were taken undercover and released by animal welfare organisations. The third picture showed pigs in a normal pen and represented no obvious animal abuse. It was taken by a professional photographer, who took the photo in co-operation with the farmer and scientists to show modern housing conditions for conventionally kept pigs. This picture was included to investigate the public's perception of undercover investigations if no animal abuse is uncovered and only conditions that comply with the law are shown. Participants were not told whether the pictures represented a violation of animal housing or handling regulations. To minimise incidental influencing factors, all three pictures showed pigs and all pictures were obtained from the same (human) perspective, as described by Busch *et al* (2017).

In the first description, the participants were told that the activist had entered the premises without the farmer's permission, and that the door was not locked. The second included damage to property, describing that the door had been locked and the activist had had to break the lock. The third description stated that the picture had been taken by an employee during working hours (whistle-blowing).

Each participant assessed only one picture in combination with all three information treatments. Participants were randomly split into three groups. The split-sample design was used to avoid a previously seen picture influencing participants' perception of the following picture. This process resulted in 876 evaluated scenarios (292 × 3). To avoid order effects, the sequence of the scenarios was randomised.

The scenarios were evaluated for their 'perceived legitimacy' and 'perceived need for punishment.' Since 'perceived legitimacy' can be regarded as a multi-dimensional construct (Thomas 2005), three adjectives were selected to avoid measurement errors. Two positive adjectives (justified and understandable) and one

Figure 1

Farm conditions	Form of invasion in farmers' privacy
1 Injured pig 	Unlocked door <p>Imagine that this picture was taken in a stable where the door was not locked. The animal rights activist could simply open the door and take the picture secretly</p> <p>If you look at the picture and know how the animal rights activist got into the barn, what do you think?</p>
2 Little space 	Locked door <p>Imagine that this picture was taken in a stable where the door was locked. The animal rights activist had to break the lock in order to enter the stable and take the picture secretly</p> <p>If you look at the picture and know how the animal rights activist got into the barn, what do you think?</p>
3 Normal conditions 	Whistle-blowing <p>Imagine that this picture was taken by an employee working in the stable. It was taken during working hours</p>

Experimental scenarios for farm conditions and invasion of farmers' privacy.

negative adjective (disproportionate) were included to ensure a balanced scale. The items were derived from Suchman's (1995) very well-known definition of organisational legitimacy. He defined legitimacy as:

a generalised perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed systems of norms, values, beliefs, and definitions.

To measure 'perceived need for punishment', a single item was used ('The described action should be punished'). Participants were then asked to evaluate the described scenario according to the four mentioned statements on a five-point Likert scale (from 1 = totally disagree to 5 = totally agree).

The following data analysis was carried out with IBM SPSS 24. First, a Principal Component Analysis (PCA) with varimax rotation was run to ensure that the three adjectives reflect the multi-dimensional construct 'perceived legitimacy.' Subsequently, because of the repeated measurements (each respondent evaluated several descriptions) and the division into three groups (each respondent saw only one picture), a mixed analysis of variance (mixed ANOVA) was applied to identify significant differences in the perceived legitimacy and the perceived need for punishment. Interactions were tested but none were found to be significant and thus are not reported below.

Table 1 Sociodemographic data.

	Sample				German population
	Group 1 (n = 103) Injured pig	Group 2 (n = 95) Little space	Group 3 (n = 94) Normal conditions	Total (n = 292)	
<i>Age</i>					
18–25	8.8%	10.5%	16.0%	11.7%	9%
26–40	19.6%	23.2%	22.3%	21.6%	22%
41–65	51.0%	43.2%	43.6%	46.0%	44%
66 and older	20.6%	23.2%	18.1%	20.6%	25%
<i>Gender</i>					
Male	57.3%	42.1%	50.0%	50.0%	49%
Female	42.7%	57.9%	50.0%	50.0%	51%
<i>Education</i>					
No educational qualifications	1.0%	1.1%	2.1%	1.4%	4%
Primary school	39.8%	38.9%	25.5%	34.9%	35%
Secondary school	25.2%	35.8%	35.1%	31.8%	31%
A-level	15.5%	12.6%	16.0%	14.7%	14%
University or vocational qualification	18.4%	11.6%	21.3%	17.1%	17%

Source: Own calculations and Federal Statistical Office (2016).

Results

Socio-demographics

A total of 325 participants took part in the study. Test persons whose answers were given too quickly (less than one-third of the median processing time) or were inconsistent were excluded from the study (Döring & Bortz 2016). Finally, 292 participants were used in the final statistic evaluation. In Table 1, the sample is described by the sociodemographic characteristics age, sex and education in relation to the German average population. The characteristics of the different groups are displayed as well.

The results showed that while 94.5% of the test persons ate meat and meat products, 4.4% were vegetarian and 1.1% vegan. The respondents were asked about their relationship towards agriculture (multiple selection was possible). The results showed that 70.9% of the respondents had no connection to agriculture at all, 8.3% lived in direct proximity to a farm, and 15.6% stated that their family or friends owned a farm. The remaining respondents were farmers, grew up on a farm or worked with farmers.

Perceived legitimacy (Q1a, Q2a)

PCA with varimax rotation showed that for each group, the adjectives for each description added up to one component that can be described as 'perceived legitimacy' (Table 2).

Subsequently, an index was formed by calculating the mean of the three items. The negatively formulated item (disproportionate) was converted (1 = totally agree to 5 = totally disagree). When calculating the index, no changes in the five-step scale were made.

Respondents perceived all forms of undercover investigation as legitimate. The evaluations were very close in all the scenarios. Small differences, however, existed and are examined in more detail below.

Table 3 shows that obvious animal abuse was perceived as most legitimate, followed by space shortages and conditions that comply with the legal requirements. Regardless of the picture seen, participants regarded forced entry as the least legitimate and whistle-blowing as the most legitimate.

The pair-wise comparison confirmed a significant difference in the mean value differences described above. The text 'locked door' stood out in particular; it was perceived as significantly less legitimate to break a locked door compared with other access options. Respondents perceived undercover investigations to be more legitimate when suspected animal abuse was actually detected than when only conditions conforming to the law were documented. However, the differences between 'injured' and 'little space', and between 'normal conditions' and 'little space', were not significant.

Table 2 Factor loadings of perceived legitimacy (Principal Component Analysis).

Form of invasion in farmers' privacy	Farm conditions		
	Group 1: Injured pig	Group 2: Little space	Group 3: Normal conditions
Text 1	$\alpha = 0.75$	$\alpha = 0.76$	$\alpha = 0.82$
<i>Unlocked door</i>	KMO = 0.61	KMO = 0.59	KMO = 0.68
The operation is justified	0.907	0.926	0.909
The operation is understandable	0.875	0.919	0.866
The operation is disproportionate	-0.682	-0.626	-0.805
Text 2	$\alpha = 0.87$	$\alpha = 0.86$	$\alpha = 0.87$
<i>Locked door</i>	KMO = 0.66	KMO = 0.66	KMO = 0.68
The operation is justified	0.943	0.935	0.931
The operation is understandable	0.920	0.901	0.434
The operation is disproportionate	-0.808	-0.809	-0.819
Text 3	$\alpha = 0.57$	$\alpha = 0.74$	$\alpha = 0.81$
<i>Whistle-blowing</i>	KMO = 0.51	KMO = 0.64	KMO = 0.62
The operation is justified	0.929	0.866	0.906
The operation is understandable	0.925	0.876	0.930
The operation is disproportionate	-0.251	-0.705	-0.716

Items measured on five-point scale: 1 = totally disagree to 5 = totally agree; α = Cronbach's alpha, KMO = Kaiser-Meyer-Olkin.

Table 3 Means (\pm SD) for perceived legitimacy.

Form of invasion in farmers' privacy	Farm conditions			Total
	Group 1: Injured pig	Group 2: Little space	Group 3: Normal conditions	
Text 1	4.05 (\pm 0.90)	3.75 (\pm 1.00)	3.57 (\pm 0.94)	3.80 (\pm 0.96) ^a
<i>Unlocked door</i>				
Text 2	3.72 (\pm 1.00)	3.35 (\pm 1.13)	3.23 (\pm 0.99)	3.44 (\pm 1.06) ^b
<i>Locked door</i>				
Text 3	4.02 (\pm 0.82)	3.82 (\pm 0.95)	3.82 (\pm 0.90)	3.89 (\pm 0.90) ^a
<i>Whistle-blowing</i>				
Total	3.94 (\pm 0.79) ^a	3.64 (\pm 0.90) ^b	3.54 (\pm 0.76) ^b	3.71 (\pm 0.83)

Index 'perceived legitimacy' measured on a scale from 1 = totally disagree to 5 = totally agree;

^{abc} Pair-wise comparison with Bonferroni-correction, superscript letters indicate significant differences ($P \leq 0.05$) between variables.

Perceived need for punishment (Q1b, Q2b)

Regarding the participants' perceived need for punishment, the desire to sentence animal welfare organisations was clearly relatively low and the assessment of appropriate punishment of the individual scenarios differed only slightly.

Table 4 shows that irrespective of the picture seen, breaking a locked door was perceived as the most punishable offence. Those who saw the picture 'little space' expressed the highest need for punishment, while those who saw the

picture 'injured' had the lowest need for punishment, irrespective of how access was gained. However, when overcrowded or normal conditions were shown, 'locked door' elicited neither approval nor rejection of punishment.

The evaluation of the texts differed significantly, while no significant differences between the pictures were detected. The results of the pair-wise comparison showed that 'locked door' significantly increased the test person's consent to a more severe punishment, compared with the other descriptions.

Table 4 Means (\pm SD) for perceived need for punishment.

Form of invasion in farmers' privacy	Farm conditions			Total
	Group 1: Injured pig	Group 2: Little space	Group 3: Normal conditions	
Text 1	2.32 (\pm 1.44)	2.49 (\pm 1.40)	2.48 (\pm 1.19)	2.43 (\pm 1.35) ^a
<i>Unlocked door</i>				
Text 2	2.69 (\pm 1.41)	2.97 (\pm 1.35)	2.98 (\pm 1.15)	2.88 (\pm 1.32) ^b
<i>Locked door</i>				
Text 3	2.10 (\pm 1.30)	2.52 (\pm 1.43)	2.17 (\pm 1.15)	2.26 (\pm 1.31) ^a
<i>Whistle-blowing</i>				
Total	2.37 (\pm 1.09)	2.65 (\pm 1.22)	2.54 (\pm 0.96)	2.52 (\pm 1.10)

Index, calculated with all items, measured on a scale from 1 = totally disagree to 5 = totally agree;

^{ab} Pair-wise comparison with Bonferroni-correction, superscript letters indicate significant differences ($P \leq 0.05$) between variables.

Discussion

In line with earlier findings by Tiplady *et al* (2013, 2015), Liebe *et al* (2017) and Schulze *et al* (2018), this study confirms the public approval of undercover investigations as well as rejection of harsher punishment (Robbins *et al* 2016). The high legitimacy for all evaluated options of access found in this study shows that increasing public awareness towards the welfare of agricultural livestock (Cornish *et al* 2016) overrules the social norms regarding farmers' privacy. Released pictures are emotionally more accessible compared to texts (Kroeber-Riel & Esch 2011). Thus, participants might feel more emotionally attached by the animal on the picture than by the situation of the farmer. Additionally, the pictures might support the public's critical view of livestock production (Cornish *et al* 2016). Hence, this might explain the lower compassion for farmers.

However, this study found similarities and differences between the released pictures of undercover investigations, which are discussed below.

A clear differentiation of the perceived legitimacy between the overcrowded and the normal farm conditions could not be identified. This result can be explained as follows: Most people criticise a lack of space and freedom of movement when evaluating modern housing conditions (Clark *et al* 2016). As the pictures 'little space' and 'normal conditions' both do not correspond to public expectations of modern livestock production, lay people might, therefore, evaluate both pictures as being similarly bad and undercover investigations as being legitimate. Further, lay people are not able to detect small differences in stocking density. Busch *et al* (2015) presented pictures of a poultry house with different stocking densities and measured similar evaluations, except for the house with very young chicks. Therefore, in our case also, both pictures may be perceived as overcrowded. An additional explanation for the similarly perceived legitimacy might be that neither picture shows environmental enrichment or straw, but both display slatted floors (Busch *et al* 2017; Busch & Spiller 2018). This result emphasises

the difference between the public's idea of livestock production and reality on farms, which seems to be one reason for undercover investigations being a legitimate means regardless of whether legally permissible conditions are shown.

A statistically significant difference was found between 'injured' and 'normal conditions.' It is plausible that injured animals arouse compassion and lead to a desire to prevent animal suffering. Therefore, undercover investigations detecting obvious animal abuse might be regarded as more legitimate. Although Schulze *et al* (2018) did not find a relationship between trust in control mechanisms and the public's approval, undercover investigations detecting obvious animal abuse may be perceived as a more trustworthy possibility to foster animal welfare. Regarding the perceived need for punishment, no significant difference was observed between the content uncovered.

In the following, similarities and differences between different informational texts are discussed in more detail.

The fact that there was no statistical difference between an animal welfare organisation entering the premises without damaging the property and an employee taking a picture during working hours may be explained as follows: Both methods do not accrue any obvious disadvantage to the farmer. One can assume that in the first intuitive evaluation, only the available information and the picture were included (Haidt 2001). Consequences for farmers might be initially ignored or perhaps seen as punishment for animal abuse. This result also stems from the fact that society classifies the two scenarios as seen by chance and therefore as more legitimate. In contrast, breaking a door may be perceived as a deliberate crime and is therefore regarded as less legitimate. Perceived legitimacy is lowest and perceived need for punishment highest when a farmer's property is damaged to carry out undercover investigations. Liebe *et al* (2017) found similar results and showed that illegal actions that aim to improve animal welfare are generally accepted. However, if damage to property is included, public support for such illegal actions decreases (Liebe *et al* 2017).

Although a generally high approval for undercover investigations was detected, the high standard deviations point to variation in public perception. One explanation for this outcome might be that the perception of emotionally loaded media coverage varies between groups of individuals (eg socio-demographics, attitudes and personal interest in animal welfare) (Tiplady *et al* 2013; Busch *et al* 2019).

The non-significant interaction effects reveal that the released material did not have an effect on public attitude as to how the undercover investigation took place. The high legitimacy for all examined forms of undercover investigation suggests that all pictures shown were perceived as animal welfare offences, and therefore pictures do not significantly influence the perception of how the access was gained. Another reason might be the public's general dissatisfaction with modern livestock production (Clark *et al* 2017), resulting in a high legitimacy for undercover investigations because they show the reality on farms and detect animal welfare abuse.

The results of this study affect farmers, politicians and society in different ways. Since all forms of undercover investigation, and especially pictures showing obvious animal abuse, are perceived as legitimate, secretly taken and released pictures are a credible source of information that influences the public's perception of livestock production. The high legitimacy might increase public pressure on retailers, farmers and politicians to modify housing and handling conditions in modern livestock production as well as intensify control mechanisms. Further, politicians must rethink the sentencing guidelines of undercover investigations because they further reduce trust in agriculture (Robbins *et al* 2016) and do not lead to the socially desired improvement in animal welfare.

The results of this study provide first insights into the differentiated consideration of undercover investigations. However, due to the study design, the study is pseudo-replicated. Thus, results are to be interpreted specifically to the set of photographs used. More general conclusions should be regarded carefully. In addition, only the properties 'farm conditions' and 'invasion of farmers' privacy' were investigated with three levels each. Besides, this study used pictures from past undercover investigations to examine realistic conditions. Although we tried to produce comparability of pictures (eg only showing pigs, taken from the same perspective), we cannot preclude the influence of other factors. However, if humans look at pictures, they mainly focus on the face region (Kano & Tomonaga 2009) to identify emotions. Further, there is evidence that pictures of individuals evoke more compassion than pictures showing a group (Kogut & Ritov 2005). Accordingly, the images of animals chosen for our experiment themselves might have influenced perceptions of undercover investigations. In further studies, pictures showing either one animal or a group of animals should be compared. In addition, only pictures from conventional pork production were shown. In Germany, which is one of the largest pig producer in the EU,

most pigs are held without outdoor access (Destatis 2011). However, the public's increasing interest in animal welfare comprises natural housing conditions which is often connected with outdoor access (Boogaard *et al* 2011; Weible *et al* 2016). In further investigations, free-range housing should also be considered to compare a possible socially accepted adaptation of livestock production (Busch & Spiller 2018) to the conventional system without outdoor access.

Further, because the legal handling of undercover investigations is increasingly coming into focus, the social need for punishment should be regarded even more intensively. Considering the partially high standard deviations, deeper insight into perspectives of different social groups, especially focusing on sociodemographic issues and attitudes, is necessary.

Animal welfare implications

The fact that undercover investigations are socially accepted regardless of what they uncover shows that concerns about animal welfare have reached considerable social importance. The approval of undercover investigations is only one part of the criticism of intensive livestock farming. The social criticism regarding modern livestock production is confirmed by emotionally loaded pictures secretly taken on farms.

Without changes in housing and handling conditions, as well as intensive and innovative control mechanisms, approval for illegal actions that aim to uncover animal abuse will probably not decrease. Rather, because of public outrage, mostly following the release of footage, undercover investigations likely promote changes in production methods and can thereby lead to improved animal welfare in livestock production (eg EU-wide ban on battery cages for laying hens after released material from undercover investigations).

Control mechanisms should be intensified to guarantee compliance with applicable housing and handling conditions. Innovative methods that support existing control mechanisms might enhance trust in livestock production and may help to improve animal welfare. Whistle-blowing, as a widespread phenomenon that has already uncovered problems in other industries (Moy 2018), may be used as an additional instrument to uncover animal abuse. If the resulting footage and pictures were objectively evaluated by an independent organisation, farmers do not have to fear manipulated pictures, consumers receive objective information and animal abuse is still uncovered (Pittroff 2014). However, the applicable laws for whistle-blowing in the respective countries must be considered. Consequently, ag-gag laws are unlikely to be the best means to solve the conflict regarding undercover investigations. According to the results of this study, stricter ag-gag laws are not perceived as useful and could further reduce trust in livestock production (Robbins *et al* 2016). From a societal perspective, the stricter prohibition of undercover investigations advocated by the agricultural sector in Germany, as in some other countries, is not a suitable means.

Acknowledgements

The authors are grateful to the Ministry of Science and Arts in Lower Saxony, Germany for funding the PhD Programme ‘Animal Welfare in Intensive Livestock Production Systems’, which led to this work being completed.

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