

## **Roundtable on hotspots in livestock production – A mixed-methods-approach for a better understanding of farmers’ and consumers’ views**

Anja Rovers<sup>1</sup>, Marcus Mergenthaler<sup>2</sup>, Christiane Wildraut<sup>2</sup>, Winnie  
Isabel Sonntag<sup>3</sup>, Marie von Meyer-Höfer<sup>3</sup>, Inken Christoph-Schulz<sup>1</sup>

<sup>1</sup> Thünen-Institut of Market Analysis, Bundesallee 50, 38116 Braunschweig, Germany

<sup>2</sup> South Westphalia University of Applied Sciences, Lübecker Ring 2, 59494 Soest, Germany

<sup>3</sup> Georg-August-University, Platz der Göttinger Sieben 5, 37073 Göttingen, Germany

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## Abstract

Intensive livestock production systems lose their societal acceptance. This paper reports how farmers and consumers communicated with each other in focus group discussions. For our analysis, a mixed-methods-approach was chosen. The heterogeneous focus group discussions with farmers and consumers were conducted in Germany. Before and after the discussions, participants assessed critical issues in animal husbandry on a short item battery. Results illustrate that both farmers and consumers have different knowledge, perceptions and visions about livestock production and animal welfare. Some of these differences remained after the discussions. However, there are also topics where a consensus between farmers and consumers could be achieved through the discussions.

**Keywords:** livestock production, farmers' perception, consumers' perception, focus group discussions, mixed methods

## 1 Introduction

Nowadays, livestock production systems are of growing public interest and concern in Western societies (TONSOR et al., 2009; VANHONACKER et al., 2012). An EU-wide survey in 2005 reveals that about 78 % of EU citizens believe that there should be done more in order to improve farm animal welfare (EUROPEAN COMMISSION, 2005). A comparable survey in 2016 shows that 82 % of EU citizens estimate that, considering the current situation, farm animal welfare should be enhanced (EUROPEAN COMMISSION, 2016). This shows that there has been an on-going discussion about how farm animals should be treated for several years (OHL and VAN DER STAAY, 2012). Public concern about farm animal welfare is rising especially with regard to intensive systems such as pig or poultry production. Farmers are criticized by the public due to perceived bad living conditions for their animals, such as indoor breeding or high stocking density (EUROPEAN COMMISSION, 2005; VANHONACKER et al., 2009; WILDRAUT et al., 2015; WEIBLE et al., 2016). Furthermore, dairy farming systems are also losing public's confidence (BOOGAARD et al., 2011; CHRISTOPH-SCHULZ et al., 2015).

Public criticism of modern animal production systems has various causes: there is a continuous shift in values concerning animals, their emotions and their rights as living beings (SPOONER et al., 2014). These developments are partly accelerated by the on-going urbanization, modern ways of mass media communication or campaigns by NGOs (THOMPSON et al., 2011; SPILLER et al., 2012).

However, farmers perceive the current situation of livestock production systems as positive and advanced or innovative. They are mostly satisfied with the performance of their animals and see it as an evidence for their well-being (TE VELDE et al., 2002; VANHONACKER et al., 2008). They often criticise consumers for their unrealistic views of agriculture as a romantic activity. Farmers often do not understand consumers' calls for enhanced animal welfare in industrialized production systems, which are mostly based on a shift in values and not on detailed technical knowledge.

Thus, clear discordance exists between consumers' and farmers' knowledge, perception, interpretation and vision of farm animal welfare (VANHONACKER et al., 2008). The lack of consensus among farmers and consumers with respect to farm animal welfare leads to the fact that farmers fear to lose social acceptance and therefore their "license to produce" (TE VELDE et al., 2002; BUSCH et al., 2013). A number of different initiatives such as windows in barn, webcams or farm visiting were started in the hope of narrowing the gap between farmers' and societies' perceptions. But until now the conflict could not be solved.

Against this background, this paper focuses on the question how farmers and consumers communicate with each other when they meet directly and how successful they are in achieving an understanding of common views and perceptions. Until now, there are only very

few studies (e.g. WILDRAUT et al., 2015) dealing with direct communicational issues between farmers and consumers in the heated debate about farm animal welfare. Thus, only little is known about suitable communication structures for solving the diverse trade-offs between animal welfare, animal protection, climate problems and profitability of animal husbandry.

Qualitative group discussions are a useful tool in this field for analyzing courses of conversation and for observing discussion structures (BOHNSACK, 2010). Therefore, six heterogeneous discussion groups with in total 26 farmers and 26 consumers were conducted in Germany using a mixed-method-approach. The aim was to investigate how both stakeholder groups communicate in direct conversations and in a neutral surrounding. Furthermore, before and after the discussion, participants were asked with a short questionnaire about identified hotspots in livestock production systems. The study was conducted in Germany because it is one of the EU's biggest livestock producing countries with a heated debate about farm animal welfare. In the past years, much has been done with regard to the improvement of farming systems and the introduction of different labeling and certification initiatives to differentiate the market. However, many people still do not trust the sector and are less willing to accept current ways of livestock production.

The objective of this study is to gain a better understanding of the conflict and the communication between farmers and consumers about modern dairy, pig and poultry production systems. Furthermore, it is the aim to identify under which conditions consensus can be achieved or disagreement between farmers and consumers persists. Using a mixed-methods-approach, potentially successful communication structures and types of argumentation between farmers and consumers concerning farm animal welfare are analyzed. Doing so, it is possible to pave the way for a fair and open-minded discussion. The ultimate goal is to establish socially acceptable livestock production systems in consensus with social norms and to reach a sustainable animal production in Europe (THOMPSON et al., 2011).

## **2 Methods**

The aim of this study, which is part of a larger interdisciplinary research project, is to give insights into farmers' and consumers' views of today's animal production systems and farm animal welfare. Participants of the study were invited to discussions about recent issues of livestock production. Therefore a mixed-methods-approach, based on a qualitative pilot study, was chosen.

### **2.1 Pilot study**

In the qualitative pilot study in 2015, farmers and citizens were separately invited for homogeneous focus group discussions about their perceptions of common animal husbandry. Focus groups with farmers had up to eleven participants (at least one female and one organic farmer per group). The discussions with also up to eleven citizens included persons with vegetarian or vegan diets because today's conditions of animal breeding could affect an individual's decision to increase or avoid the consumption of animal products. The participants were chosen by a market research company regarding several quota (18 to 70 years old, at least 50% female participants, at least 33% employed), relevant for each focus group. Additionally, only persons without any agricultural background (qualification, personal milieu) could take part. For each animal species (pigs, cattle and poultry), two focus group discussions with farmers and six with citizens were conducted. Venues were chosen based on low or high concentration of the regarded species or areas with more alternative farming systems (referring to STATISTISCHE ÄMTER DES BUNDES UND DER LÄNDER, 2011). The locations for the discussions both with farmers and citizens are outlined in Table 1 (columns homogeneous discussions).

**Table 1: Locations of discussions with farmers and citizens**

Topic	Homogeneous discussions		Heterogeneous discussions
	Farmers	Citizens	Farmers and citizens
<b>Cattle</b>	<ul style="list-style-type: none"> <li>• Schleswig (Schleswig-Holstein)</li> <li>• Kempten (Bavaria)</li> </ul>	<ul style="list-style-type: none"> <li>• Schwerin (Mecklenburg Western-Pomerania)</li> <li>• Essen (North Rhine-Westphalia)</li> <li>• Kempten (Bavaria)</li> </ul>	<ul style="list-style-type: none"> <li>• Tarp (Schleswig-Holstein)</li> <li>• Kempten (Bavaria)</li> </ul>
<b>Pigs</b>	<ul style="list-style-type: none"> <li>• Borken (North Rhine-Westphalia)</li> <li>• Thürkow (Mecklenburg Western-Pomerania)</li> </ul>	<ul style="list-style-type: none"> <li>• Oldenburg (Lower-Saxony)</li> <li>• Fulda (Hessia)</li> <li>• Halle (Saxony-Anhalt)</li> </ul>	<ul style="list-style-type: none"> <li>• Borken (North Rhine-Westphalia)</li> <li>• Rostock (Mecklenburg Western-Pomerania)</li> </ul>
<b>Poultry</b>	<ul style="list-style-type: none"> <li>• Frisothe (Lower-Saxony)</li> <li>• Magdeburg (Saxony-Anhalt)</li> </ul>	<ul style="list-style-type: none"> <li>• Hamburg (Hamburg)</li> <li>• Vechta (Lower Saxony)</li> <li>• Würzburg (Bavaria)</li> </ul>	<ul style="list-style-type: none"> <li>• Oldenburg (Lower Saxony)</li> <li>• Magdeburg (Saxony-Anhalt)</li> </ul>

To ensure comparability, a common guideline for the discussions both with farmers and citizens was developed. All discussions – both with farmers and citizens – took up to 120 minutes and were recorded and transcribed afterwards. A content analysis following a category system was used to structure the main results (based on MAYRING, 2002). It was performed with MAXQDA Plus 12. Referring to the common discussions’ guideline, the categories were developed and compared in close coordination with the research partners. Due to the qualitative character of the study and its limitations regarding representativity, differences such as the participants’ age or gender were not analyzed.

The main results of the discussions with farmers and consumers were compared and discussed in a workshop. Based on these findings, five dilemmas representing the main common discussion points were developed (see Table 2).

**Table 2: Dilemmas**

Dilemma	Tenor
1	Our society has a decreasing direct connection to animal husbandry, therefore information about agriculture are mainly obtained from the media.
2	Farm animals should get better husbandry conditions; however, it is often unclear who should pay the additional costs for this aim.
3	Today’s livestock pens are very technologized and automatized; however, the farmers’ work is easier and the farm animals can be better observed.
4	The use of medicine in animal husbandry is viewed critically; however, farm animals should be treated when they are sick.
5	Farm animals have the right to care and responsibility by humans; at the same time they should serve us mainly for food production.

## 2.2 Mixed methods study

Based on the pilot study, six heterogeneous focus group discussions with farmers and consumers about the pre-designed dilemmas were conducted (participants differ in the relevant criteria *farmer* or *person without agricultural background*, see LAMNEK, 1998). For

each animal species, two heterogeneous discussions were conducted. For the selection of the locations, several criteria were considered. The chosen cities were in different federal states, considering North, South as well as East and West Germany. The animal densities in the regions were considered for the three animal species again (referring to STATISTISCHE ÄMTER DES BUNDES UND DER LÄNDER, 2011), including various forms of animal husbandry (more intensive or more extensive). The locations are shown in Table 1 (right column for heterogeneous discussions).

Following the sampling strategy of the pilot study, farmers were invited, supported by farmers' associations. Each focus group consisted of at least four to six farmers and a similar number of consumers. As in the pilot study, participating consumers were chosen by a market research company. Quotas regarding age (18 to 70 years old), gender (at least 50% female) and employment (at least 33% employed) were specified in order to achieve well-mixed groups. In contrast to the previous study, consumption of animal products (regarding the three animal species as discussion topics) was a requirement.

In order to evaluate if farmers' and consumers' attitude changed during their discussion about the hotspots in livestock production, a mixed-methods-approach was employed. Thereby, qualitative and quantitative approaches were combined in a single or multi-phased study (TASHAKKORI and TEDDLIE, 1998).

For the quantitative part, the pre-designed dilemmas discussed in the focus group discussions were transformed into statements which were then assessed by all participants (marked as farmer or consumer) before and after the discussions. Therefore, the dilemmas were divided into two parts. Based on the pilot study, part A of the statements represents the consumers' and part B the farmers' points of view (see Table 3).

**Table 3: Statements**

Statement	Tenor
1A	Our society has a decreasing direct connection to animal husbandry.
1B	Information about agriculture comes mainly from the media.
2A	Farm animals should get better husbandry conditions.
2B	Nobody wants to pay the additional costs for better husbandry conditions.
3A	Today's livestock pens are very technologized and automatized.
3B	Technology makes farmers' work easier and farm animals can be better observed.
4A	The use of medicine in animal husbandry has to be viewed critically.
4B	Farm animals should be treated when they are sick.
5A	Farm animals have the right to care and responsibility by humans.
5B	Farm animals should serve us mainly for food production.

The statements were presented with a 9-point Likert Scale also including the option "*I can't assess*". Agreement or disagreement was measured on scales ranging from "*fully agree*" to "*fully disagree*". Full agreement was transformed into a value of 9 and full disagreement into a value of 1. Means were calculated for farmers and consumers separately before and after the discussions. To check if there were changes in the assessment of the statements, non-parametric tests were used in order to take account of the small samples sizes and the less

restrictive assumptions on the distribution in non-parametric tests. Two-sided exact significance values were calculated. P-values smaller than 0.1 were interpreted as significant. Changes of attitude between farmers and consumers were tested for significant differences with the Mann-Whitney-U-Test for independent samples. Differences between the assessments before and after the discussions were tested with the Wilcoxon matched-pairs signed-rank test for related samples. Tests were performed with IBM SPSS Statistics 21.

The qualitative part of the study consists of a discussion about the pre-designed dilemmas (see Table 2). The discussion time per dilemma was restricted to about ten minutes. Again, data were collected via recording and transcribed afterwards. Based on the communicative-discursive character of the focus groups, strategies for modified attitudes and behavior could be identified (LAMNEK, 1998). Hence, in addition to the content analysis used in the pilot study (see MAYRING, 2002), special attention was paid to the way arguments were put forward by both farmers and consumers. All qualitative analysis was conducted with MAXQDA Plus 12 again.

A pre-post comparison of the valuation of statements in combination with the qualitative part allows deeper insights in the causalities. Following ONWUEGBUZIE and TEDDLIE (2003), complementarity and development are important reasons for a mixed-methods-approach. Thus, enhancement and illustration of the results from one method can be achieved with the results of the other method. In this regard, focus group discussions have the advantage to give insights into the structure and processes of individual or collective opinions (LAMNEK, 1998).

### 3 Results

The pre-post comparison of the statements' valuation shows four different types of changes of attitude (see Table 4).

**Table 4: Mean assessments of statements by farmers and consumers before and after joint group discussions with respective differences and changes**

Type of change	State ment	Changes				Before				After			
		C	sig	F	sig	C	F	Δ	Sig	C	F	Δ	sig
No changes	1A	0,36	0,22	0,15	0,38	6,92	8,15	1,23	<b>0,00</b>	7,28	8,31	1,03	<b>0,02</b>
	2B	0,09	0,91	0,19	0,57	5,70	6,54	0,84	0,22	5,79	6,35	0,55	0,49
	4B	0,20	0,27	0,15	1,00	7,76	8,46	0,70	<b>0,05</b>	7,96	8,62	0,65	<b>0,02</b>
	5A	0,27	0,28	0,12	0,50	8,04	8,50	0,46	0,15	8,31	8,62	0,31	0,18
Changes of farmers	1B	0,04	0,94	1,23	<b>0,01</b>	4,30	2,04	2,27	<b>0,00</b>	4,35	3,27	1,08	<b>0,08</b>
	3A	0,08	0,56	0,38	<b>0,04</b>	7,50	7,35	0,15	0,99	7,42	7,73	0,31	0,37
Changes of consumers	3B	1,40	<b>0,01</b>	0,15	0,55	6,40	8,12	1,72	<b>0,00</b>	7,80	8,27	0,47	0,21
	5B	1,51	<b>0,00</b>	0,01	0,95	5,25	7,68	2,43	<b>0,00</b>	6,76	7,69	0,93	0,12
Changes of consumers and farmers	2A	2,02	<b>0,00</b>	0,92	<b>0,01</b>	7,58	2,96	4,62	<b>0,00</b>	5,57	3,88	1,68	<b>0,00</b>
	4A	2,37	<b>0,00</b>	0,81	<b>0,03</b>	7,87	3,96	3,91	<b>0,00</b>	5,50	4,77	0,73	0,29

Notes: Table shows mean values of assessments of statements (1=fully disagree; 9=fully agree) differentiated for consumers (C) and farmers (F), differences (Δ) between farmers and consumers with corresponding exact 2-sided significance levels (sig) by Mann-Whitney-U-tests, differences (Δ) between before and after assessments with corresponding exact 2-sided significance levels (sig) by Wilcoxon matched-pairs signed-rank tests.

In the following, the discussion results are presented for each type of change in the points of view.

### **1. No changes: statements 1A, 2B, 4B and 5A**

No changes of the participants' view before and after the discussions, neither for farmers nor for consumers, could be noted for the statements 1A, 2B, 4B and 5A. These are statements where consumers as well as farmers rather agree. Compared to consumers, farmers have an even higher level of agreement before as well as after the discussions. Considering the difference between farmers and consumers for statement 1A and 4B, the changes are significant before and after the discussion, indicating a dissent that remains despite the discussion. For statements 2B and 5A, changes of attitude among farmers and consumers are not significant neither before nor after the discussion, indicating that consensus remains.

Discussions included dialogs about well-known facts and developments on decreasing direct connection to animal husbandry (1A) and the still open question who should pay for additional costs for better husbandry conditions (2B). Mostly the conversations about the dilemma 1 started with a common agreement, as shown in the following example:

Farmer (cattle): *“Well, I think that’s right, the society has fewer and fewer connection because contacts are missing.”*

Consumer (cattle): *“I agree. Especially in cities there is no connection and even in rural areas are less and less farmers.”*

Despite these verbal agreements during the discussions, in the statements before and after the discussions, farmers and consumers did not consent and showed different levels of agreement before and after the discussions. No significant changes of neither farmers nor consumers could be observed in the pre-post-comparisons. While the direct discussions indicate consensus in this issue, the anonymized quantitative assessments showed a dissent.

Within dilemma 2, farmers emphasized that animal welfare is in line with high animal performance and tried to point out that actual husbandry conditions are not too bad. Besides, consumers admitted to buy food as cheap as possible and thus being at least partially responsible for the low producer prices. Furthermore, farmers stressed the point that modern husbandry systems enable even poor people to buy meat every day:

Farmer (poultry): *“Modern agriculture makes it possible for each consumer to buy and consume meat.”*

Although consumers indicated that they would be willing to pay higher prices for animal welfare, they referred to their limited financial means:

Consumer (pig): *“Bearing of additional costs is one thing. I believe everybody is ready to do this as long as he can afford it financially.”*

Farmers explained their limited possibilities for better husbandry conditions because of the low prices: higher animal welfare standards would mean higher production costs which won't be covered as higher revenues cannot be reached. The consent between farmers and consumers with respect to statement 2B remained in the pre-post-comparisons.

Social norms like the treatment of sick animals (4B) and the right of animals to care and responsibility by humans (5A) were not discussed controversial, either. Yet, despite the agreement in the discussions, farmers and consumers differed significantly in their assessment of statement 4B before and after the discussions.

Overall, only few arguments were used by farmers and consumers. In some cases facts and analogical arguments were used to emphasize the own position. In the context of dilemma 4, dealing with the treatment of sick animals, consumers asked how long latencies after treatments are and farmers explained it, for example in the case of milk:

Consumer (cattle): *“What is the timeframe after a treatment with medication?”*

Farmer (cattle): *“For example, when we talk about a dairy cow which has bovine mastitis, what sometimes can happen. It can have many reasons but mostly it is*

*streptococcal. It has to be treated because it is a bacterium. The usual treatment with so-called penicillin G is four days latency.”*

Within dilemma 5, differences between pets and farm animals were addressed both by farmers and consumers, but not controversial. When consumers expressed doubts about the adequacy of treatments of farm animals, revealing their attitude towards the respective statement, farmers responded with strong arguments that did not allow for objections or a consideration of alternative treatment strategies.

As consumers did not change their assessments of the respective statement after the discussions, this kind of argumentation by the farmers was obviously not able to induce changes. In the quantitative assessment of the respective statement, the consensus between farmers and consumer remained unaffected by the discussions.

## **2. Changes of farmers: statements 1B and 3A**

With respect to the statements 1B and 3A, the farmers' assessments changed significantly after the discussions. While consumers gave a rather indifferent assessment before and after the discussion, farmers rather disagreed on statement 1 B. After the discussion they came closer to a middle position, but the difference with consumers remained significant. In the course of the discussions about dilemma 1, the role of the media was critically reflected, especially by the consumers. Consumers assumed that information in the media is not always objective and neutral:

Consumer (pig): *“I believe it is slightly primitive to believe everything in media.”*

Although they pointed out not to have many direct connections to producers, they emphasized their own possibilities to establish them. The following passage demonstrates this:

Consumer (cattle): *“But I think, everybody has the choice to find out about those things. Of course we live in a media society, representing and influencing our opinion. But everybody has the possibilities to inform himself, even to ask farmers and producers directly.”*

However, some farmers agreed with the statement and argued that media only publish bad news in order to make profit and do not tell the truth or report objectively:

Farmer (poultry): *“That is sad because good news were not published in media, only bad news. Most people are reading the boulevard press (...) and trust their reports.”*

Against this background, several examples of the consumers were given where they describe their experiences while informing themselves, like in the following examples:

Consumer (cattle): *„I simply started with my small children long ago. We decided that we wanted to see how it is working.”*

Consumer (cattle): *„We have the luck to live in a rural area with many farms. Next to us, we have a little milkhouse where you can take milk directly from the farmer, day and night. We support that very much.”*

The farmers had no counter-arguments, but pointed out their willingness for insights in their husbandry. They named direct marketing or an “open day” as examples.

After the discussions, farmers changed their attitude significantly in the quantitative assessment of statement 1B, coming closer to the consumers' values but still not enough to bridge the divide between farmers and consumers. This is an indication that farmers won a better understanding of the consumers' limited possibilities to get fact-based, direct information about farms.

With respect to statement 3A, farmers and consumers both clearly agreed and the results for both groups did not differ significantly. Farmers increased their level of agreement after the discussion, but differences between the two groups remained not significant, indicating that consensus between farmers and consumers remains regarding statement 3A. With respect to dilemma 3, farmers talked about technological changes in other sectors and used analogical arguments, as demonstrated in this example:

Farmer (cattle): „*Cars are important for everybody today, everybody needs a car and doesn't object against technological improvements.*”

Furthermore, the farmers explained some technological innovations in the agricultural sector, for example a concentrated feed robot and its benefits:

Farmer (cattle): “*It's an easement for me and it is much better for the cow's digestion.*”

They also produced normative arguments, pointing out to have more time to care for the animals. Farmers also connected technology with better husbandry conditions for animals like improved indoor climate conditions or ideal feed compositions which could not be achieved if done manually. Consumers remarked that such benefits are not communicated effectively and even objected that a fully automated barn causes anxiety and discomfort.

Consumer (poultry): “*(...) but when I imagine such a fully automatic stable, whether for poultry or other animals – that scares me a bit.*”

Nevertheless, consumers could comprehend why farmers use technological innovations:

Consumer (pig): “*It would be stupid not to make use of technology.*”

At the same time consumers regretted a loss of naturalness. Thus it became clear for the farmers that consumers generally have little knowledge about technical improvements in the agricultural sector. Therefore some consumers were concerned about the exploitation of the animals because of technological innovations. Farmers argued that this is not correct, but the consumers underlined that they suspect exploitation based on the technological innovations, for example extreme high milk yield.

### **3. Changes of consumers: statements 3B and 5B**

A changed consumer attitude could be identified for the statements 3B and 5B while no significant changes occur for farmers. While farmers had high levels of agreement with these statements before and after the discussions, consumers had weak tendencies for agreement before the discussion, but increased their level of agreement significantly after the discussion. Therefore consensus developed within the discussions between consumers and farmers because consumers changed their mind. As described above within dilemma 3, farmers used analogical arguments to explain some benefits in animal husbandry, based on technical improvements. Furthermore, farmers tried to explain that automatic systems and technical improvements could improve animal welfare. Discussions showed that more knowledge about technical improvements leads to a better understanding of how farmers and animals can benefit. Beyond that, farmers used emotional phrases to illustrate possibilities to devote their saved time. As in the following examples, they described how to care better after their animals with a normative argument:

Farmer (cattle): “*Because I do not have to put out the whole dung by wheelbarrow, I have more time to look after each single animal.*”

Farmer (poultry): “*(...) there is an alarm system which gives an alert if the feeding system does not work or animals get no water. It calls the farmer on his cell phone and tells him there is something wrong in the barn.*”

Referring to consumers' concerns of animal's exploitation, farmers mentioned other yield-increasing criteria and explained that technical improvements are not decisive. As shown by the following example, farmers used analogical arguments:

Farmer (cattle): “*Milk yield is not based on techniques, but mainly on breeding. There was a selection.*”

The farmers' detailed and technical arguments convinced consumers and they showed significantly higher levels of agreement with statement 3B after the discussion. Therefore farmers' explanations were able to transform a dissent before the discussion into a consensus after the discussions.

During the discussions about dilemma 5, farmers made statements about the role of meat and animal source foods in humans' nutrition. According to their opinion, livestock production is necessary. Farmers also emphasized that a farm animals are not raised for any other purpose than food production. Consumers were in accordance, emphasizing that the consumption of animal products is a part of commonly accepted economic transactions and has nothing to do with any moral constraints or bad conscience:

Consumer (pig): *"That is the right (of the consumer) because he has paid for it."*

Consumers made a clearer distinction between farm and home animals at discussion's end.

Consumer (pig): *"If we talk about farm animals, I know that life is not a bed of roses."*

Some fear-causing arguments about deficiency signs were stated. But consumers acknowledge a lack of information about animal production systems:

Consumer (pig): *"I can't ask any questions, if I have no clue about it."*

Farmers confirmed this statement, pointing out that there is no basis for criticism. Further, farmers emphasized their role concerning the care of animals with a right to life.

Farmer (pig): *"The husbandry conditions, if you go back some years or decades, they have improved considerably (...) because the knowledge base improved."*

They admitted to be under constraint and to have to economize, but confirmed a decent handling with their animals, because that is their only way to make profit:

Farmer (pig): *"The foundation of our economic activity are our animals and our soil. And we take care of them as good as possible."*

Partly consumers remained doubtful if there are alternatives. Despite the doubts that remained for some consumers, farmers were generally able to "convince" consumers during the discussions, as the consensus due to the consumers' change of mind indicated after the discussions.

#### **4. Changes of consumers and farmers: 2A and 4A**

Both farmers and consumers changed their attitudes significantly during the assessments regarding their opinions of the statements 2A and 4A. For both statements, the levels of agreement differed significantly between the two groups before the discussions. Consumers had high levels of agreement while farmers showed weak levels of disagreement. After the discussions, both sides had moved towards each other: consumers had lower levels of agreements and farmers had higher levels of agreement though their changes remained smaller as compared to consumers.

Farmers pointed out that recent husbandry conditions aren't as bad as often presented in negative media reports. While discussing dilemma 2, farmers mentioned again that only good housing conditions lead to healthy animals and so enable profit, like in the following example:

Farmer (cattle): *"We as farmers are anxious for the wellbeing of our animals. When we build a stable, we configure it in a way that the animals can feel well, because we make a profit with the animals. (...) When they do not feel well, our profit is low."*

Consumers indicated appreciation, but mentioned such facts have to be communicated better because a normal consumer has no idea what good husbandry conditions are.

For statement 4A, the difference between farmers and consumers became insignificant as the discussion revealed a consensus between the groups. In the discussions about dilemma 4, consumers pointed out their fear of resistant germs. Farmers signaled them understanding and described countermeasures (e.g. medication for sick animals). It was stated that in the case of milk, there are strict supervisions and the milk of a treated cow has to be poured away. Otherwise, there will be a sentence.

Pig producers pointed out the monitoring program for antibiotics and thereby used authority arguments in order to take away the consumers' concerns.

Farmer (pig): *"Well, Germany really is a pioneer. (...) We have very high requirements with regard to the use of antibiotics."*

Farmers also referred to activities of different private and public control and monitoring systems. In addition they mentioned vaccination programs that have reduced the use of antibiotics in the last couple of years. Consumers wanted to get more details, indicating their discomfort with current practices in animal husbandry:

Consumer (pig): *“For me as a consumer, the question arises how the use of drugs influences the quality of meat?”*

Explanations by farmers induced some changes of consumers’ assessments in the respective statement 2A. Yet, the changes were not great, so that differences remained significant even after the discussion, indicating that the extent of dissent was reduced but basically remains.

## **4 Summary and Discussion**

Results of this study illustrate critical topics within the ongoing debate on public concerns about animal welfare. The study revealed that both groups – farmers and consumers – have different perceptions about animal welfare. Furthermore, the study confirms the results of TE VELDE et al. (2002) and VANHONACKER et al. (2008) that for farmers, the most important indicators concerning animal welfare are management, technical improvement and the husbandry system. On the other hand, consumers stressed the need for a caring and empathetic human-animal-relationship (e.g. VANHONACKER et al., 2010). However, it can be observed that there are issues which lead to consensus between farmers and consumers if they talk and listen to each other.

All in all, farmers and consumers mostly used factual arguments in the discussions. However, farmers’ share of the discussions was clearly dominant and showed their higher levels of involvement as they are affected economically and thus more fundamentally by the public discussions. Farmers were better informed and had more incentives to engage in the discussions with consumers. It was shown that if the farmers’ information was credible and trustworthy for the consumers, they built up trust and listened to farmers. However, if farmers do not take consumers’ concerns seriously and try to tell them “their truth”, consumers do not change their attitude or point of view.

Thus, for a better socially accepted livestock production, both parties have to listen to each other carefully and adapt their way of argumentation and action respectively. To reflect each other’s view can be valuable for understanding the counterpart and for reacting adequately. By identifying consumers’ lacks of information or wrong imaginations, farmers have to find possibilities to communicate central aspects of modern livestock production comprehensibly. On the other hand, by considering the consumers’ points of view, farmers can comprehend some critical points and understand the consumers’ attitude towards modern animal husbandry systems. They can react to consumers’ concerns by developing alternative animal husbandry systems which need less explanation to convince consumers. Additionally, this can be useful to address consumer segments (VANHONACKER et al., 2014).

In order to demonstrate how the two sides are able to change their point of view, a mixed methods approach was chosen. First, focus groups as a qualitative method have several advantages. They are useful to cover widespread opinions and their structures of consciousness (LAMNEK, 2005). The participants’ interaction and an exchange of views are decisive (MAYRING, 2002). Many results were obtained in a dynamic process and were unexpected (HALKIER, 2010), which would not have been possible with quantitative methods. Second, the pre-post comparison of the statements’ valuation showed four different types of change to underline, that both sides indeed move towards. Consumers change their assessment of the statements after the discussion in a stronger way than farmers do. They seem to be more open to new information and new arguments and re-adjust their evaluation. This is also indicated by the lower number of evaluations made before the discussions, when consumers did not feel confident enough to make any judgment due to a lack of information.

Farmers, on the other hand, seem to be more inclined to explain their point of view and less interested in the consumers' perspectives. That's why they gain less new information from the discussions with consumers. Therefore farmers see less need for re-adjustments and rather keep their perceptions as they were before the discussions.

With respect to the employed statistical procedures it has to be mentioned that medians calculations do ideally correspond to non-parametric tests. Still it was decided to do the quantitative presentation of the assessments on the basis of the means (instead of medians) as the means show more details. Based on the character of qualitative studies, the results are not representative, but give deeper insights into the recent debate concerning livestock production. The study shows that communication between farmers and consumers is helpful but has limitations. In some cases there is no convergence. However, communication is a helpful tool for policy makers to sensitize consumers and farmers for each other when introducing labelling systems or tightening livestock regulations. Farmers should also use communication strategies especially when they improve livestock conditions by their own motivation to regain the society's trust.

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