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Citizens' Perception of Different Aspects Regarding German Livestock Production

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ABSTRACT

This paper presents the actual perception of German citizens regarding the importance of different husbandry aspects. In 2017, an online survey with 2.400 respondents, based on a qualitative pilot study with focus groups, was conducted. Participants discussed about their perception of actual animal husbandry with respect to the design of stables and animal-related aspects. Using two different ranking procedures, main points of criticism as well as sideshows could be identified for fattening pigs, dairy cattle production and laying hens. The results will contribute to establishing livestock production systems in consensus with citizens' preferences.

Keywords: *Livestock production; citizens' perception; focus groups; online survey; ranking procedure*

1 Introduction

Livestock production is a recent topic of public interest and dominates consumption debates (Vanhonacker et al., 2008; Tonsor et al., 2009; Vanhonacker et al., 2012). Following an EU-wide survey in 2005, about 78 % of EU citizens stated that there should be done more for improving the welfare of livestock (European Commission, 2005). Another survey in 2016 showed that 82 % of EU citizens argue that farm animal welfare should be enhanced (European Commission, 2016). Thus, it has been an on-going discussion about how farm animals should be treated for several years (Ohl and van der Staay, 2012).

Farmers are often criticized by the public who is assuming bad living conditions for livestock in intensive systems such as pig or poultry, most notably regarding indoor breeding and high stocking density (European Commission, 2005; Vanhonacker et al., 2009; Wildraut et al., 2015; Weible et al., 2016). But dairy farming systems are also losing public´s confidence (Boogaard et al., 2011; Christoph-Schulz et al., 2015). In contrast, farmers describe the current situation as positive and are mostly satisfied with the performance of their animals which is seen as an evidence for their well-being (te Velde et al., 2002; Vanhonacker et al., 2008). Furthermore, farmers often criticize consumers for having unrealistic, romantic views of agriculture.

This shows a clear discordance between consumers´ and farmers´ perception of livestock production and farm animal welfare (Vanhonacker et al., 2008). The lack of consensus among farmers and consumers leads to a declining social acceptance of farmers and livestock production (te Velde et al., 2002; Busch et al., 2013).

The mismatch between current livestock production systems and societal perceptions is also reported for Germany (Kayser et al., 2012; Weible et al., 2016), one of the EU's biggest livestock producing countries. As a consequence, the *Scientific Advisory Board on Agricultural Policy, Food and Consumer Health Protection* at the Federal Ministry of Food and Agriculture in Germany established nine guidelines to ensure prospective animal husbandry practices, accepted by the majority of society (WBA, 2015).

Against this background, this paper presents the importance of different livestock production aspects for German citizens, based on the guidelines of the WBA. The aim of this paper is to show citizens' perceptions of the production types fattening pigs, dairy cattle and laying hens[1]. We conducted an online survey with 2.400 respondents in 2017, divided into 400 respondents for each of the three production types[2]. The objective was to gain better understanding of citizens' most important aspects of criticism and sideshows regarding substantive forms of pig, cattle and poultry production. Our results can contribute to the question of which aspects can lead to a widespread accepted livestock production of fattening pigs, dairy cattle and laying hens in Germany. The paper is structured as follows: The following section describes methods and data, including the qualitative pilot study and the quantitative survey. The third chapter shows the results of both parts. Chapter 4 deals with the summary, a short discussion and includes some conclusions.

2 Methods and Data

In this study, a mixed methods approach combining qualitative focus group discussions and a quantitative online survey was applied and carried out with almost representative quotas for the German population.

2.1 Qualitative pilot study

First, a qualitative pilot study was conducted in 2015. Citizens were invited to focus group discussions about the topics pig, poultry and cattle production. For each topic six focus groups (poultry: eight) took place in three (poultry: four) German cities. 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). Furthermore, according to the qualitative character of the pilot study, our aim was not to gain representative results but rather an overview of citizens' perception in Germany, so locations in South, East and North Germany, including metropolitan regions and smaller cities, were chosen. The selected locations for the discussions are shown in Table 1.

[1] Topic laying hens was conducted by Georg-August-University Göttingen, Chair of Food Marketing.

[2] In this paper, we only deal with fattening pigs, dairy cattle and laying hens. Within the survey, three other types of livestock production were considered: sows and piglets, beef cattle and broiler chicken. Again, for each production type 400 respondents were asked.

Table 1.
Locations of focus group discussions

Topic	Locations	State
Pig	Oldenburg	Lower Saxony
	Fulda	Hessia
	Halle	Saxony-Anhalt
Cattle	Schwerin	Mecklenburg Western-Pomerania
	Essen	North Rhine-Westphalia
	Kempten	Bavaria
Poultry	Hamburg	Hamburg
	Vechta	Lower Saxony
	Würzburg	Bavaria
	Erfurt	Thuringia

Source: own illustration

The aim of focus groups is to ascertain perceptions and opinions as well as deeper structures of consciousness (Lamnek, 2005). Single opinions do not have priority but reveal the range of views. The interactions between the participants and their changes of view are of main importance (Mayring, 2002). Thus, in contrast to standardised surveys, unexpected issues can outcrop (Halkier, 2010).

As today's conditions of animal breeding could affect an individual's decision to increase or avoid the consumption of animal products, our focus group discussions included people with vegetarian or vegan diets. Up to eleven participants per group were chosen by a market research company regarding several criterions for each focus group (18 to 70 years old, at least 50% female participants, at least 33% employed). Nevertheless, it was not a goal of this pilot study to identify differences such as the participants' age or gender. Additionally, only people without any agricultural background (qualification, personal milieu) could take part in this pilot study.

Participants discussed about their perception of actual livestock production with respect to stables and animals, regarding the crucial points of the Scientific Advisory Board's guidelines.

In the course of the discussion, specific questions on the essential contents of the various guidelines from the expert board followed, which were paraphrased in keywords according to Table 2 in order to make them easier to understand for the participants. These keywords were taken up in open questions (e.g. *"How do you think does a dairy stable looks like?").*

Table 2.
Guidelines and keywords for the focus group discussions

No.	Guideline	Keywords for the focus group discussions
(1)	Access of all animals to different climate zones, preferably outside climate	Outdoor access, fresh air supply
(2)	Offer of different functional areas with different flooring types	Design oft the stable, flooring type
(3)	Offer of facilities, materials and stimulants for the species-appropriate occupation, food intake and body care	Manipulable material
(4)	Offer sufficient space	Space per animal
(5)	No need for amputations	Amputations and surgeries
(7)	Significantly reduced use of pharmaceuticals	Medication only in case of illness, varying food, no imported food, only pasture-based food (only for dairy cattle), no genetically modified food

Source: own illustration based on WBA, 2015

Finally, the discussions consisted of two main parts with the following keywords:

- In the first part, participants discussed about their perception of the design of stables: flooring type, space per animal, fresh air supply, manipulable material for engagement, outdoor access and daylight.
- The second part was about animal-related topics: no amputations or surgeries, medication only in case of illness, varying food, no imported food, only pasture-based food (only for dairy cattle) and no genetically modified food.

The recorded discussions took up to 120 minutes and were transcribed afterwards. Content analysis was used to structure the main results[3] in a category system for each of the livestock production types (based on Mayring, 2002). The analysis was performed with "MAXQDA Plus 12". To ensure comparability, we developed a comparable guideline with these aspects for all animal species and discussed it within a three-person researcher group. The main results of the discussions for all production types were compared and discussed in a workshop.

Discussions' results were fundamental for the following quantitative survey which is almost representative for the German population regarding several quotas as explained later.

2.2 Quantitative survey

Based on the outcomes of the focus groups, an online survey about citizens' perceptions of the production types fattening pigs, dairy cattle and laying hens was developed[4]. The survey was conducted in December 2017 with 2.400 respondents and 400 respondents per production type. Quotas of the full sample and the different splits were almost representative for the German population regarding age, gender, income, education and federal state. Again, only people without any agricultural background

[3] Further results of these focus group discussions are published otherwise.

[4] Hereby, again all six livestock production types were considered. Due to reasons of space, this paper just deals with those mentioned.

(qualification, personal milieu) could take part in the survey. This paper focuses only on a small part of the online survey and presents two ranking procedures.

Therefore, main aspects of livestock production were – analogical to the qualitative pilot study – shown in two different rankings. One included different stable-related aspects: flooring type, space per animal, fresh air supply, manipulable material, outdoor access and daylight. The other one included the following animal-related aspects: no amputations or surgeries, medication only in case of illness, varying food, no imported food, only pasture-based food (only for dairy cattle) and no genetically modified food. We decided to present two ranking questions (stable related and animal related) instead of just one. The reason for this was an assumed overload of our respondents.

For the analysis, the relative distributions were calculated. Respondents should rank these aspects using number one for the most important one, number two for the second important one and so on.

3 Results

First, the quintessences of the focus group discussions for pig, dairy cattle and poultry production are described. Second, results of the online survey referring to the three production types are shown.

3.1 Results of the qualitative pilot study

The main results of the discussions about **pig production** could be outlined as follows:

- Space per animal was the dominating aspect in all discussions.
- Artificial lighting and air conditioning was supposed, especially in big stables.
- Gestation crates were described in own words but neither their name nor their function was known.
- Balls or chains in the stables as manipulable material were less assumed. The general importance of activities for pigs was emphasised and pigs were described as intelligent animals needing facilities for their activity.
- Injuries because of slatted floors were also assumed.
- Castration was mentioned as a surgical intervention but it was not known that it is as a common procedure in pig production.
- With respect to breeding, it was mentioned that pigs are very sensitive for illnesses and not robust. It was assumed that this would lead to the need of medication and not allow outdoor access.
- Sometimes stables were described as closed systems, without daylight or fresh air. That was seen as a consequence of the sensitive animals.
- With regard to food, imported food or imported components of food and preventive medication in food was mentioned in all discussions.

The focus group discussions on **cattle production** can be summarized as follows:

- Pasture feeding was described as the ideal conception of dairy cattle.
- Limitations as a result of basic conditions were acknowledged and it was mentioned that dairy cattle are often only kept in closed stables. It was even stated that cows could be always fixed in grids without the possibility of movement.
- The use of technology such as milking robots was more often seen critically than positively. On the one hand, several advantages for the animals were seen, on the other hand a reduced relationship between farmers and their dairy cattle was described as a negative disadvantage.
- Cow brushes for grooming as a manipulable material were not well known and only rare mentioned.
- With respect to food, grass and hay were seen as natural feedstuffs for dairy cattle. The ingredients of concentrated feed were mistrusted and it was discussed whether and how much roughage cattle would receive. Sometimes, it was stated that dairy cattle only get concentrated feed with lots of “chemistry” in it.
- A prophylactic medical treatment of dairy cows was very intensively discussed. Antibiotics were assumed as given regularly and preventively. In contrast, prophylactic administration of drugs to lactating cows was seen as not allowed.

Discussions about **poultry production** showed these main results (compare: Sonntag et al., 2016):

- The ban of conventional cage systems in the EU and Germany was not very well known.
- Keeping systems with bars and cages for laying hens and broiler chicken were perceived as very negative and not animal friendly.

- Words as “full”, “dark”, “cruel life” and “pumped with antibiotics” were used to describe keeping systems for laying hens and broilers.
- In contrast, outdoor or an organic keeping system of poultry was seen positively.
- The preventive use of medication and antibiotics was dominating all discussions.
- Residuals were supposed in chicken meat and eggs, leading to a bad influence for humans’ health.

3.2 Results of the quantitative survey

In the following, the relative distributions of stable-based aspects and animal-related aspects are presented. First, results for stable-based aspects are shown for the livestock production types fattening pig production (figures 1), dairy cattle production (figure 2) and laying hens production (figure 3). Second, we present the distributions for the animal-related aspects of fattening pig production (figure 4), dairy cattle production (figure 5) and laying hens production (figure 6).

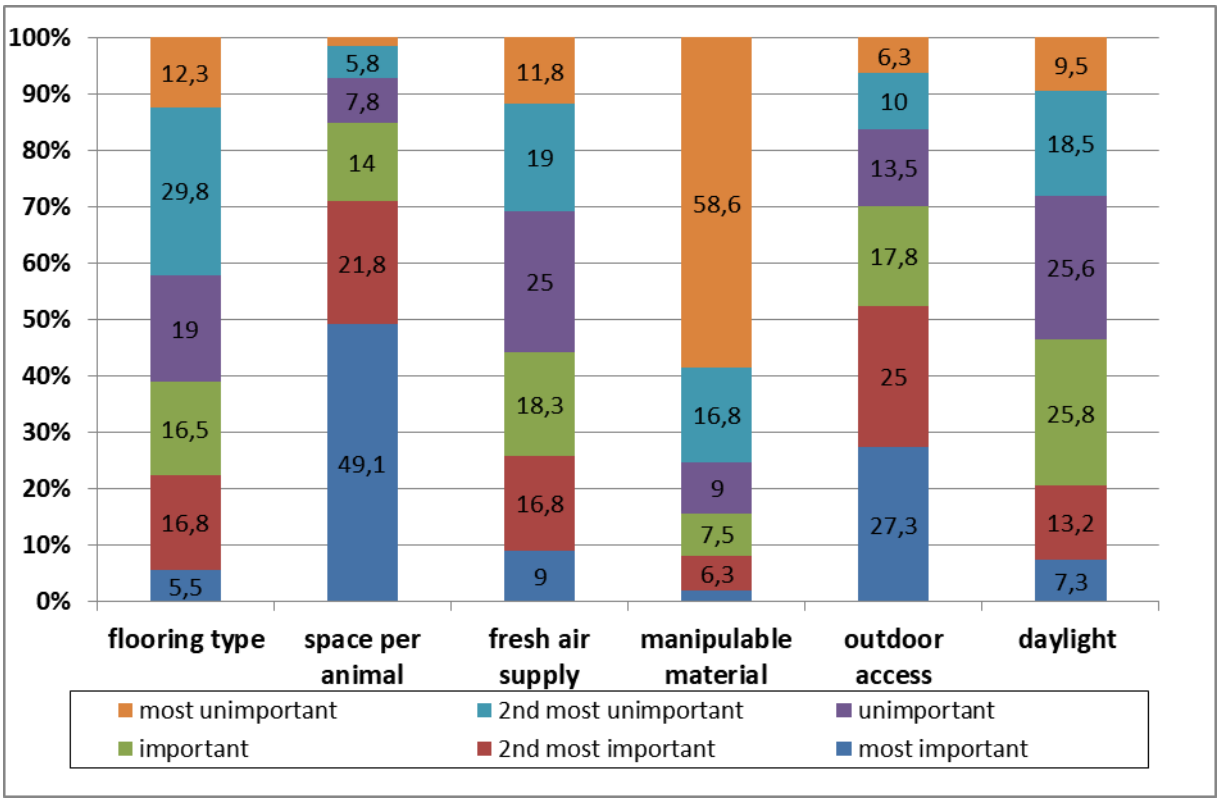

Figure 1. Ranking of stable-based aspects for fattening pig production[5]
Source: own calculation and illustration

Regarding fattening pig production, space per animal was clearly the most important stable-related aspect for half of the participants (49.1 % most important), followed by outdoor access (27.3 % most important). Manipulable material is the most unimportant aspect (58.6 % most unimportant). The latter was a surprise to us as the focus groups strongly indicated a high importance of manipulable material because of pigs being intelligent animals in need of possibilities for engagement. As participants talked about injuries caused by splatted floors, the aspect of flooring types was also often mentioned during the focus group discussions. But in the ranking, flooring type was the second most unimportant (29.8 %) or most unimportant (12.3 %) aspect. Results for fresh air supply and daylight were almost equal.

[5] Values < 5 % are not labelled in figures 1 till 6.

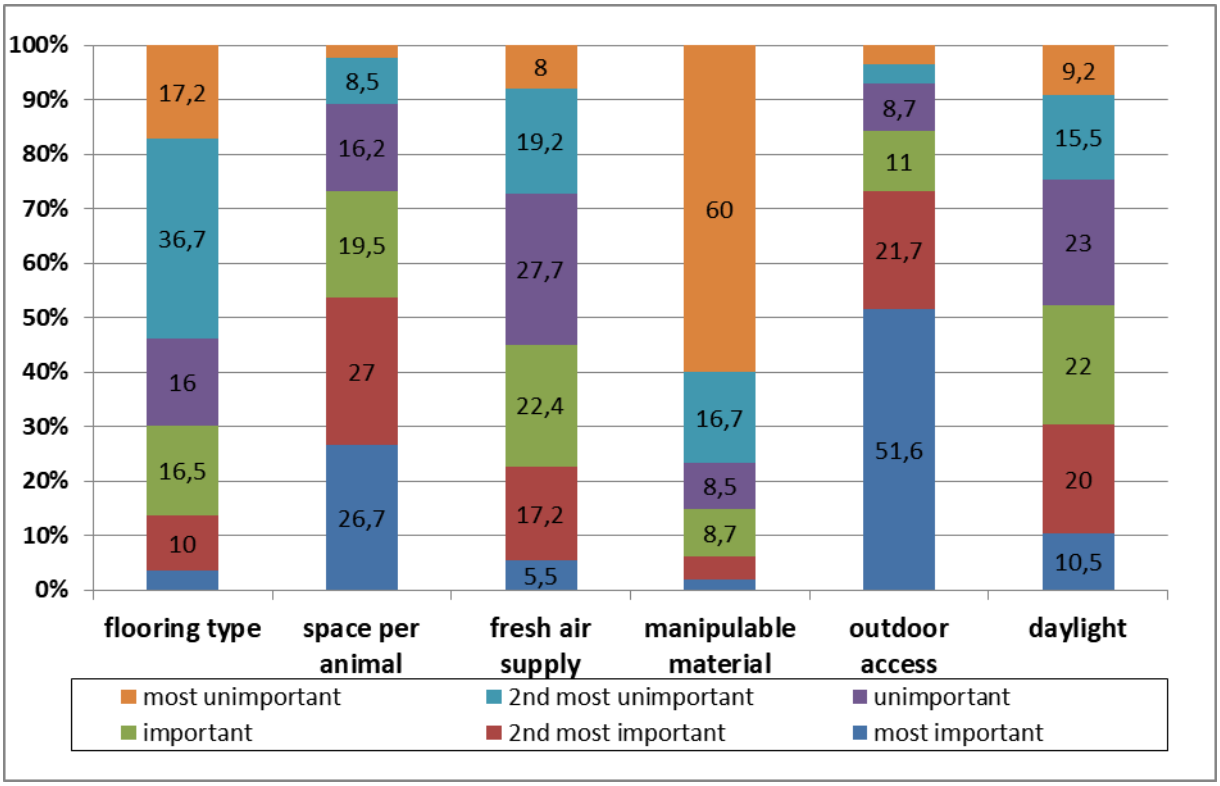

Figure 2. Ranking of stable-related aspects for dairy cattle production
Source: own calculation and illustration

In contrast to fattening pigs, outdoor access was for more than half of our respondents (51.6 %) the most important aspect with respect to dairy cattle production, whereas space per animal was it for less than a third (26.7 %). Again, manipulable material was the most unimportant aspect (60 %). Those results go in line with our findings from focus groups as discussants argued that dairy cows need pasture grazing not only for food, but also for engagement and for their well-being. The ranking result of flooring type with 36.7 % for second most unimportant and 17.2 % for most unimportant aspect was a surprise, as soft lying surfaces were described positively for cattle during discussions.

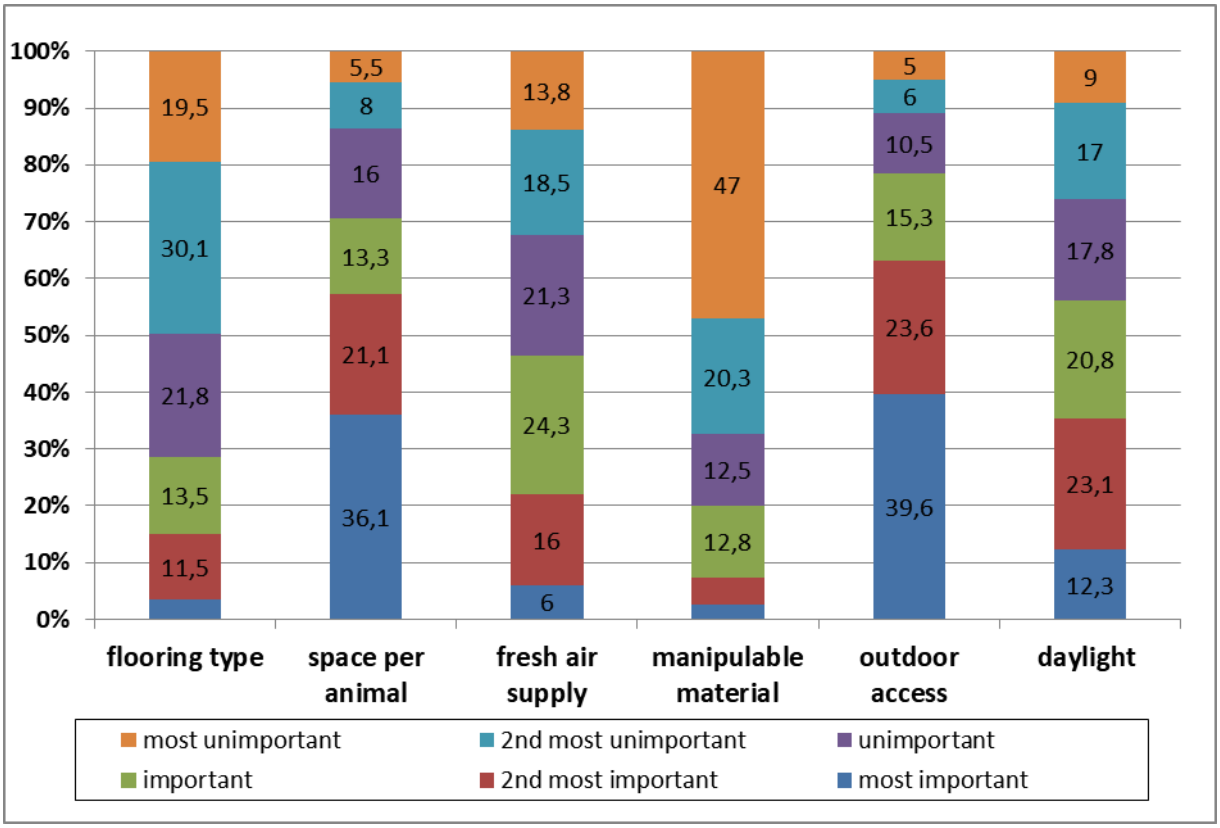

Figure 3. Ranking of stable-related aspects for laying hen production
Source: own calculation and illustration

Results for laying hens stables show no major difference between space per animal and outdoor access; for 39.6 % of the participants this is the most important aspect, closely followed by space per animal (36.1 %). Focus group discussions showed participants supposing that conventional cage housing systems with limited space per animal are still in use and outdoor access was described positively for laying hens. In line with the focus groups is the result for manipulable material as the most unimportant aspect (47 %) for laying hens. Compared with the ranking procedure results for fattening pigs (see fig.1), space per animal is all in all less important and outdoor access is less important for laying hens compared with dairy cattle (see fig. 3).

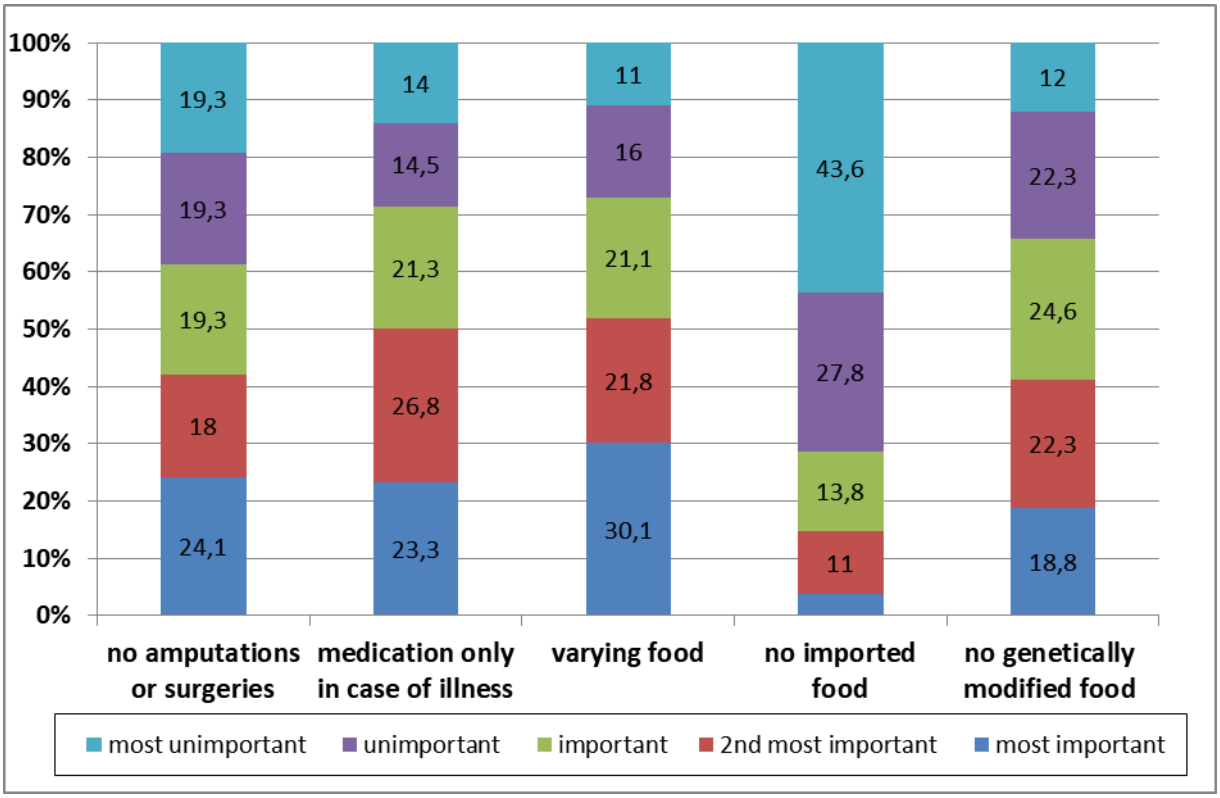

Figure 4. Ranking of animal-related aspects for fattening pigs
Source: own calculation and illustration

The animal-related aspects show clearly that the import of food is the most unimportant aspect (43.6 %) of the five labelled aspects in this ranking procedure. Varying food is the most important aspect (30.1 %) which is not in line with the results of the focus group discussions. They indicated a high importance of medication only in case of illness because participants supposed preventive medication, especially the use of antibiotics, and mentioned worries about residues in pork. This aspect was only for 23.3 % the most important aspect after varying food and no amputations and surgeries (24.1 % most important).

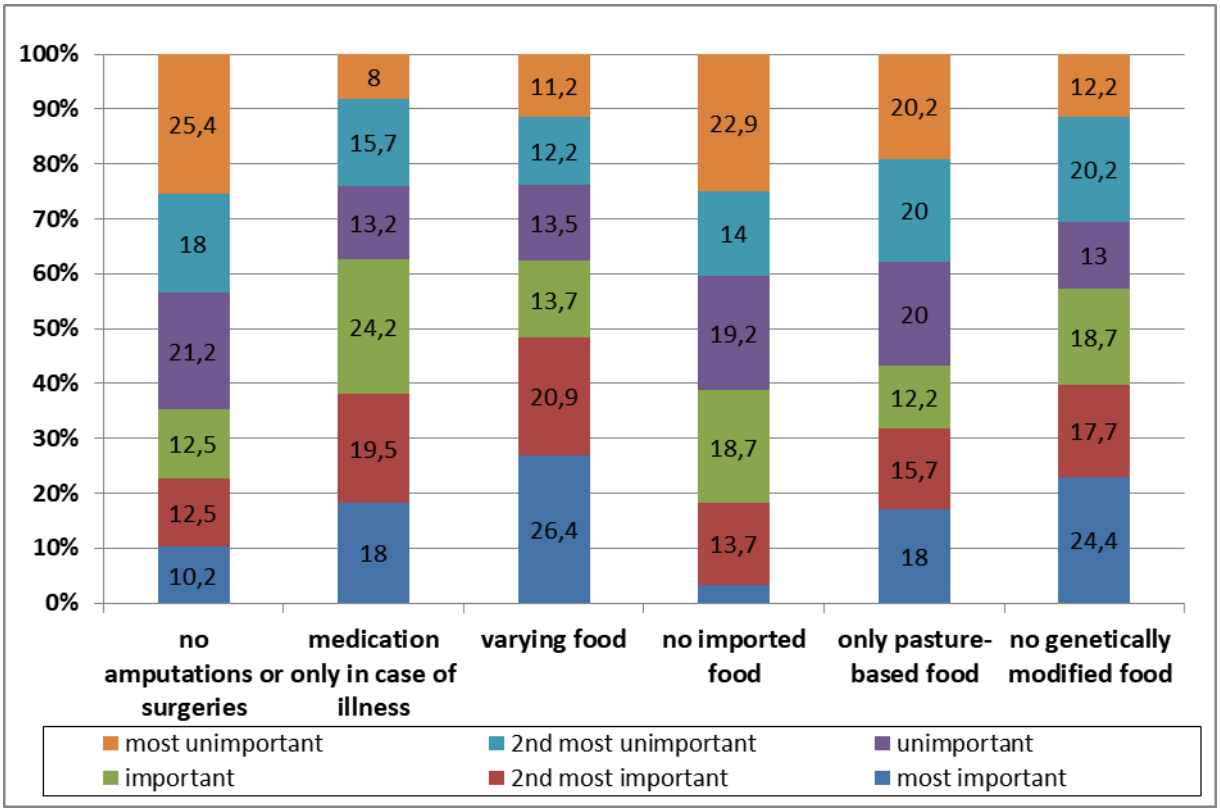

Figure 5. Ranking of animal-related aspects for dairy cattle production
Source: own calculation and illustration

Because of the high importance of pasture-based food for dairy cattle in our focus group discussions, we additionally presented this aspect in the ranking. But it was not so important for the respondents as varying food (26.4 % most important) and no genetically food (24.4 %) and with 18 % equal as medication only in case of illness. Compared with the results for fattening pigs (see fig. 4), the aspect of no amputations and surgeries is all in all more unimportant and with 25.4 % the most unimportant animal-related aspect regarding dairy cattle.

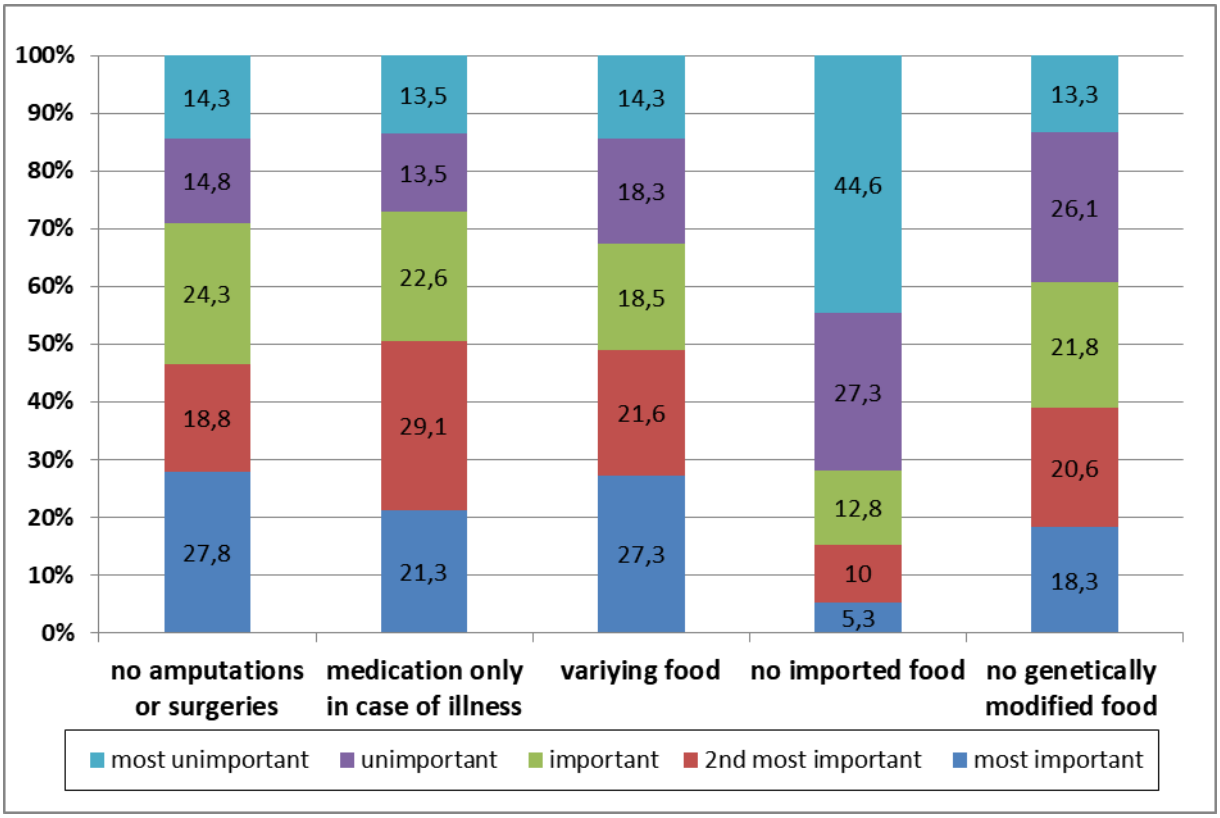

Figure 6. Ranking of animal-related aspects for laying hens production
Source: own calculation and illustration

No amputations or surgeries is the most important animal-related aspect regarding laying hens production (27.8 % most important), nearly equal with varying food. This is also a surprise compared with the focus group discussions. Thereby, participants discussed a lot about medication and supposed the use of antibiotics because of high stocking densities. Similar to the pig and pork discussion, residues in eggs were supposed. But the ranking procedure shows not such great importance of the aspect medication only in case of illness (21.3 % most important). Compared with fattening pigs and dairy cattle, the absence of imported food is the most unimportant aspect (44.6 % most unimportant).

4 Summary, discussion and conclusions

4.1 Qualitative pilot study

The analyses of the previous focus group discussions show some common aspects of livestock production for the three animal species pig, dairy cattle and poultry. Many respondents expressed concerns about modern animal husbandry and stated the need of improvement regarding the living conditions of farm animals. Free-range husbandry and organic farming had a better image than conventional husbandry. These results are in line with earlier research which reported a low societal acceptance of modern animal husbandry (e.g. European Commission, 2016; Boogaard et al., 2011; Ohl and van der Staay, 2012; Weible, 2016).

Our participants mainly discussed about the lack of space per animal, especially for fattening pigs; results that were also found by other researchers before (e.g. Wildraut et al., 2015; Weible et al., 2016) and the need for outdoor access, especially in case of dairy cattle (e.g. Christoph-Schulz et al., 2015).

Pasture keeping of dairy cattle is considered positively; this is in line with other studies (Christoph-Schulz et al., 2015). Technological innovations such as milking robots were seen critically because of participants suspecting a reduced relationship between farmers and their animals as one possible consequence. An assumed preventive use of medications, and in particular antibiotics, was discussed very intensively and closely together with care about human health. Thereby, the use of antibiotics and its suspected residues were dominating the focus groups. Regarding pig production, manipulable material was stated as needful for pigs beyond space per animal. However, Busch et al. (2015) showed in their study with photos that

manipulable material is not identified by respondents in their study in its function, even when it is available in the stables. In poultry production, cage system housing is still present in participants' perception and only outdoor and organic livestock husbandry had a positive image (Sonntag and Spiller, 2016).

To sum up, we found great differences between citizens' perception and the reality within the qualitative study, equivalent to the results of Ermann et al. (2016) dealing with pigs. They conclude that visits to stables should be offered for critics and media representatives to demonstrate transparency.

4.2 Quantitative survey

Some quantitative results of our ranking procedures differ from results of the previous focus groups: A possible reason for this might be the method of a ranking procedure. While discussants in the qualitative study were able to state that several aspects are equally important to them or could describe their opinion in more detail, respondents of the online survey had to make a clear decision which aspect is the most important, the second most important etc. for them. Consequently, they were not able to state how close the aspects lay together in their opinion. Furthermore, some aspects of the rankings "include" others, e.g. daylight is "included" in outdoor access. That may lead to the fact that daylight is ranked as unimportant while setting outdoor access as an important aspect.

The quantitative results of the rankings show differences between the considered animals. Outdoor access was the most important factor for dairy cattle which is in line with previous studies(Hellberg-Bahr and Steffen, 2012; Christoph-Schulz et al., 2015). Risius and Hamm (2017) showed a high importance of pasture-based production for respondents regarding beef. Space per animal was the most important one of all aspects for fattening pigs (49,1 %). Grunert et al. (2018), dealing with different attributes of pig production, came to a similar result and found that free mobility for the sow is more important than attributes related to food safety and health for German respondents. For laying hens, both aspects are nearly close together. Reasons might be the influence of the media, showing sometimes negative examples of livestock production like pigs and poultry closely together in cramped stables. Furthermore, amputations and surgeries on cattle and poultry are not as thematised as on pigs. Regarding all three investigated animal species, medication only in case of illness was all in all not as important as in the focus group discussions. That might be explained with the fact that the survey was about animals and their husbandry. In contrast, some participants of the focus groups talked about own experiences with antibiotics, e.g. about failed antibiotic treatments in themselves or in relatives. They supposed a correlation between meat consumption and the previous animal food or therapy with antibiotics and a bad meat quality. This was also shown by Sonntag et al. (2018) for broiler chicken.

4.3 Common conclusions

Against the methodological background and regarding both, qualitative and quantitative results, the importance of mixed methods approaches becomes obvious. Of course, a limitation of the qualitative pilot study can be found in the low representativity. But the previous focus groups enabled us to detect unknown aspects like the relevance of manipulable material for pigs. Participants supposed pigs as intelligent animals which like to find engagement on the one hand. On the other hand, as a result of the online survey, manipulable material is not as important as space per animal or outdoor access. Thus, just tendencies about main aspects of production systems can be observed by both studies. Keeping the example of fattening pigs in mind, manipulable material is not as relevant as space per animal or outdoor access for the respondents. But if there is not enough space per animal or no outdoor access etc., manipulable material seems to gain importance because the pigs have no other options for their engagement. Additionally, following participants of the focus groups for a better perception of fattening pig production, stables should have more space, different areas with different flooring types, some manipulable material and several sources of engagement. Participants thought that the wellbeing of pigs is positively influenced by space and sources of engagement. If stables have enough space and different areas, even outdoor access will not be so important – daylight and fresh air supply seem to be other positive drivers for improved animal welfare. The same issue was detected with respect to dairy cattle and laying hens.

As a consequence, it seems that improvements in livestock production are difficult to communicate towards the society. But, credible communication is essential for a better societal acceptance of livestock production. In addition, communication strategies which demonstrate the improvements in husbandry systems are needed (Busch et al., 2015). Beside these results, further analysis is needed to get a widespread impression of citizens' perception.

Concerning the quantitative data collection, factor and cluster analysis are needed to describe the sample in more detail and to identify different societal segments.

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