

What is the benefit of organically-reared dairy cattle?

Societal perception towards conventional and organic dairy farming

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ABSTRACT

During the last years, current systems in agriculture and food production have been topic in public discussions. Especially modern animal husbandry seems not to match consumers' or societal needs any longer. This paper concentrates on the society's perspective regarding dairy farming in general and diverting perceptions and expectations with respect to dairy cattle either reared organically or reared conventionally. It aims to give orientation to farmers as well as policymakers about the societal point of view of dairy farming.

Six focus groups were carried out in three German cities to capture the scope of opinions and expectations among the population. Three of those groups consisted of participants buying mainly organic food while the other three comprised citizens buying mainly conventional food.

With respect to society's perception of today's dairy farming results showed that participants put emphasis on the following topics: the space for each cow was considered as insufficient and not species-appropriate, assumed application of medications as too high, and in particular the prophylactic use of antibiotics as problematic.

Asked about perceived differences between organic versus conventional farming it became obvious that organic in contrast to the conventional farming was perceived as more species-appropriate. More or less, all previously criticized aspects seem to be regarded as irrelevant in organic farming. Some participants showed a very romantic view of organic dairy farming. The most critical point was an assumed high rate of rogue traders among organic farmers.

Keywords. society; dairy farming; perception; expectations; ecologically

1 Introduction

In many public discussions the present systems in agriculture and food production became a widely debated topic; especially modern animal husbandry seems no longer to match consumers' expectations or societal needs. How can this be explained? Modern agri-food production has turned into a highly mechanized sector. This change is critically perceived by the society in general although farmers have tried to capture societal concerns by different measures, e. g., by improving animal health or reducing emissions. Reasons for on-going societal criticism may be based on the fact that people's view on agriculture is quite strongly formed by childhoods' picture book stories and later intensified by messages

transported via product marketing while continuous adjustments of this sector are neither reflected in the media nor perceived by the society. And more, problems of small scale picture book farms are, in general, unknown (SALAMON et al., 2014).

A spot light of this criticism is on modern animal husbandry. With respect to pigs and poultry there are numerous studies dealing with the perception and expectations of society and consumers (e. g. ANDERSEN, 2011; KRYSTALLIS et al. 2009; LILJENSTOLPE, 2008; WEIBLE et al. 2013). In contrast, expectations and perceptions concerning dairy farming are only seldom tackled. This is quite astonishing as dairy production is an important agricultural sector in Germany. Milk is a significant input for the food industry as it is processed into numerous different products, which are in high favor of consumers and increase in demand. In Germany, per head consumption of fresh milk products reached 82,2 kg and of cheese 23,9 kg in 2013 (BMELV, 2014); however, the share of organic milk is still quite low, varies between 1.7 % in the case of butter and 5 % for drinking milk (AMI 2014; AMI 2013). Milk and dairy products account for the second highest share compared to the total turnover of the food industry (BVE, 2014). Abolition of the milk quota system will certainly lead to an increase in German milk production which might intensify criticism in dairy cow keeping.

Based on these facts relevant questions for the scientific community are:

- How is dairy farming perceived by different groups?
- Which are important topics, main points of criticism and what is seen as already good practice?
- Are there causal relations between individual perception?

Aim of the study is to capture societal perceptions concerning the current quality of dairy farming and, based on those results, to extract expectations of the society which can be used to improve the present system of dairy farming. A focus is put on perceived differences between organic and conventional dairy farming as well as the pros and cons of both farming types. Farmers and decision makers will be given an orientation with respect to major topics of the current criticism and possible ways to an improved perception will be pointed out.

The paper is structured as follows: Section two presents a literature review regarding societal perceptions of modern animal husbandry. Section three describes the methodology, results are presented in section five and the final section gives a short conclusion.

2 Background

Societal perception of current agriculture and especially of modern animal husbandry systems were analyzed in various national and cross-national studies. Depending on the general topic of the studies different issues are mentioned. One group of studies deals with the topic of animal welfare and protection putting mostly a special focus on pigs, poultry and laying hens. In general, the people indicate preferences for species-appropriate animal husbandry in most of the member states of the EU. Often participants state that they would be willing to pay more for food originating from species-appropriate animal husbandry, but they also demand a better labeling policy to characterize the respective food items (EUROBAROMETER, 2005). European citizens placed the importance of animal welfare at 7.8 on a scale of one to ten (Germany: 8.1). Although about 60 % of respondents believe that animal welfare has been improved in the last 10 years 75 % argued for additional improvements (DLG, 2009; EUROBAROMETER, 2007). When compared to other types of animal husbandry (especially pigs and poultry/laying hens) acceptance of dairy cattle and sheep husbandry was higher (HARPER and HENSON, 2001).

In Germany responsible handling of animals and production factors as well as production of food items with a high product quality are important with respect to agriculture (TNS EMNID, 2012). Some studies found that species-appropriate animal husbandry has the same (ZANDER and HAMM, 2010) or a higher importance (SGS FRESSENIUS, 2011) for consumers than regional origin. Deficits in current animal husbandry are attributed especially to space limitations (KAYSER, 2012). A connection is seen between available space for animals and other critical items in husbandry, like applications of antibiotics or other medicine or increased numbers of behavioral disordered animals. Species-appropriate animal husbandry with sufficient space is seen as a solution for those problems (WEIBLE et al., 2013).

In contrast, if the main focus of an analysis is on the quality of food, animal welfare and ethical problems are seldom mentioned (HARPER and HENSON, 2001). Within those studies, criteria like food safety, food quality and health are discussed more deeply by the respondents. Hence, if adjacent, citizens are specifically questioned with respect to animal welfare, they will also express strong concerns against modern animal husbandry and point them out as reasons for changes in their consumption pattern. To

conclude: modern animal husbandry induces concerns in general which will not (yet) be reflected in purchase decisions or are superposed by other impressions (ALVENSLEBEN, 2002).

With regard to dairy farming, BOOGARD et al. (2011) show that Dutch citizen realize advantages due to a modern and hygienic system while at the same time they request traditional and nature-orientated farms. Perception and evaluation of modern dairy cow husbandry appears to be ambivalent. Neither it is fully accepted nor completely rejected. Therefore BOOGARD et al. (2011) conclude that a medium acceptance of modern dairy farming exists in the Dutch population combined with a cautious attitude against new modern developments (BOOGARD et al., 2011). HELLBERG-BAHR et al. (2012) depict that in Germany, a preference for high standards in animal welfare and environmental protection can be found. About half of the respondents prefer ecological produced milk or milk produced on grassland; however, stated preferences are not revealed in buying decisions. ZANDER et al. (2013) point to the fact that the view on agriculture of the German society is quite divers; however, in its basic attitude - to some extent - negative. Quite critical opinions are to be found within those groups which showing a wider knowledge on agriculture.

3 Method

An explorative method was used to gain insights in the topic: focus groups. This method might be carried out for eliciting respondents' (in our case: citizens) perceptions, attitudes and opinions (WILSON, 1997: 209) and takes advantage of group interactions to determine participant's motives, which cause their behaviour. Participants are confronted with other participants' opinions, attitudes or perceptions, and may have to justify the own opinion, attitude or perception. Hence, 'individual response becomes sharpened and refined, and moves to a deeper and more considered level' (FINCH et al., 2003: 171). An interview guide was carried out in advance to structure the discussion and to ensure that the points of interest were discussed. In December 2013, six focus groups were carried out in Hannover, Dresden and Munich with six to eleven participants. As focus groups do not provide representative results but a scope of opinions on a certain topic, a limited number of discussions are regarded as sufficient. In the study presented here no new aspects were raised by the participants after the fourth discussion group. The interview guide had been discussed in advance with an expert in dairy farming. It comprised, inter alia, topics concerning participants' perception of conventional as well as organic dairy farming, the pros and cons of these two types of farming and participants' expectations regarding dairy farming. The aspect "costs" was not regarded explicitly. First, there are reliable statistics concerning real purchase data of organic milk products. Moreover, discussions on this topic are often affected by socially desirable answers.

Participants were recruited by a market research agency. Quotas concerning age (20-70 years old), gender (33.3 % - 66.6 %), and employment (not more than 67 %) were specified in advance in order to achieve heterogeneous groups. Three groups consisted of participants buying mainly organic food; the other three groups consisted of citizens buying mainly conventional food. People with a professional background concerning agriculture, food or market research were excluded. Discussions had a length of about 90 minutes and were documented by audio and video. Afterwards, they were verbatim transcribed and analysed using open coding, a process to consider the transcripts for a first understanding of underlying concepts and dimensions. To avoid that participants prepare themselves for discussion the topic was not announced in advance. Even if questions were directed to the moderator they were not answered during the discussions and no additional information was given.

4 Results

4.1 Perception of dairy farming in general

In the beginning of the discussion participants were asked to talk about their perception of today's dairy farming in Germany. The moderator solely mentioned 'dairy farming' without any additional information like 'conventional or organic' or 'small or big'.

Most discussants perceived dairy farming as intensively mechanized and farms as economic enterprises where animals would be used instead of machinery. One discussant described '*big stables*'* where cows were tended for by an '*assembly line*'. Expressions like '*factory*', '*industry*' and '*aseptic*' were often used. Some were convinced that cows were kept in boxes on 'whatever pads' possible with a minimum amount of space to move. Hence, other participants reported about free-stall barns and mentioned stables

* Citations were translated from German into English

without walls (cold stalls) providing a good air ventilation. Whether cows were kept on meadows or not would be depended on the number of dairy cows kept which were estimated to range between 50 and 1000 animals. For large farms it would be impracticable – in *'purely mathematical terms'* – to keep the cows on grassland, simply due to the herd size.

With respect to feeding, most participants mentioned that a big share would be concentrated feed, but also grass, hay and straw would be fed. Several discussants stated that concentrated feed would be intensively manufactured and would contain additives like vitamins and minerals. A strong relation to land availability was assumed as the following statements indicate: *'If a farmer has five meadows then the critter will - quite surely - grow up. If he produces maize they will get maize. But if he owns no land then he will need to buy concentrated feed and then, he himself, does not know its contents.'* In this context prophylactic application of medical products, especially antibiotics, was addressed by discussants. Respondents criticized fodder of animals would be enriched by pharmaceuticals on a regular basis so that animals would not infect each other when they are kept quite closely together. And also a performance-enhancing impact of antibiotics was seen as a reason for the application. Hence, there was no unified opinion across participants about reasons why animals would be treated with antibiotics. A good/large share of discussants speculated that closed barns would enable easy infection from animal to animal and therefore, animals were in need of pharmaceuticals. Others presumed cows kept in stables would need less pharmaceuticals compared to cow kept outside who could catch more easily infectious pathogenic germs. Participants presumed economic efficiency would lead to strongly condemned husbandry conditions. Thus, economic requirements would dictate to keep cows in orderly rows in stables instead to keep them free ranging on grassland.

However, participants' view was strongly influenced by the farm size. They emphasized the need to distinguish between *'smallholder part-time farms'* and *'agrarian factories'* before talking about their perception. From discussants point of view, agrarian factories are specialized and focusing on dairy or meat production in which cows would be regarded as objects. It was assumed that cows have insufficient space and are kept in *'boxes'*. Participants assessed that the feed stuff in larger farms would be primarily concentrated feed due to a lack of meadows. Farmers without enough meadows and grassland would be required to buy feed. And this would be mainly concentrate. Concentrated feed was not completely rejected but two aspects were seen very critical: First it would be more efficient respective more *'output-oriented'* compared to grass and it was explicitly criticised that the cows would get more and more just to enhance milk yields. And secondly it was assumed that in the case of bought feed farmers would not be able to prove that their feeding does not contain harmful substances.

In contrast to *'agrarian factories'*, participants perceived *'smallholder part-time farms'* as generally better and more *'rural'*. From discussants point of view, cows of part-time farms would be treated individually and better. Small farms were most often associated with part-time farmers; a point that was seen very positive. For small farms it was indirectly assumed that the cows have more space. And it was argued that these farms normally have enough meadows and are able to give enough grass or hay to the cows. Additionally, participants mentioned the quality of the husbandry would always depend on how *'humanly'* the farmer would treat his animals.

To describe the state of the art in current husbandry also vacation memories were cited: One respondent explained she would go on vacation to Garmisch (Bavaria, South of Germany) for many years and cows would be kept outside there.

4.2 Expectations of dairy farming in general

Asked concerning the expectations towards the situation of and conditions in dairy farming, the participants favoured more space per animal and free-ranging on grassland. Expressions like *'free-ranging'*, *'a green meadow'* or *'free-ranging, no boxes'* characterize those expectations. More free movements are not the only reason for the request of free-ranging. Additionally, the interaction between animals is also seen as important for the participants. Here, communication should not be restricted to animals next to them but should be enabled with their comrades farer away. A further aspect for grazing was to allow cows to choose what they prefer to eat, and not what is provided by the farmer.

Some participants wished for open barns in which cows could move outside or stay inside as preferable. With respect to fodder it was preferred to be *'fresh'* and *'without chemical additives'*. However, additives of vitamins and minerals were not rejected in general; however, chemical additives were disapproved. Debatable was to what extent concentrates should be used, whether it would make sense to push milk yields to their potential limits. Important topics for participant were also regular visits of the veterinary service and controls including fodder controls. It was requested to check for the wellbeing of the cows and whether they would be fed properly.

Discussions on expectations concerning dairy farming revealed an intensive tendency of pathetic fallacy. Participants more often drew conclusions based on human needs. Cows would require '*alternations*' and should not always be kept '*at the same temperature*'. One would know '*how nice the sun would be*' and one would imagine a cow would feel likewise. Animals would be unable to take stress and they would be stressed '*by the same things than humans*'. One participant summarized his wishes as follows: '*a cow is just another human being*'.

However, another participant wondered whether the fulfillment of all those expectations would not have consequences for the agri-food production as more labor and modern techniques would be required to achieve the mentioned wishes. He asked himself whether the consequence would not be a price explosion and a decline in demand.

4.3 Perception of conventional and organic dairy farming

After discussing about participants' general perceptions and expectations towards dairy farming, they were requested to state their perceived differences between organic and conventional dairy farming in detail. An overview of these perceived differences between organic and conventional is presented in table 1. Here, respondents' perception was differentiated. Some showed black-white thinking when describing the differences with conventional farming as very negative and organic farming as very positive. Other respondents were more critical and argued that the drawn picture would not be realistic in general. And some even leveled differences out and were sure that no real differences exist. Conventional dairy farming was mainly described as '*factory farming*' with lots of animals. It was assumed that '*farmers are allowed to keep more animals*' compared to organic farmers and that cows are regularly kept in stables with '*no or not enough access to open air*' or '*rarely enough space*'. Feeding was assumed to be mainly concentrated feed, enriched with additives like '*performance improving supplements*' and often genetically modified. Grass and hay were assumed to be rarely fed. Respondents mentioned that cows got prophylactic medical treatment especially with antibiotics and different kinds of vaccinations and/or hormones. The reason for this treatment was assumed to be on the one hand performance improvement ('*doping for cows*') on the other hand disease prevention. The prophylactic use and especially the use to increase the milk yield were harshly criticized. But respondents agreed that cows should be treated with medicine in case of illness. With respect to antibiotics discussants worried about possible residues in dairy products. The relationship between cows and farmers was very important for some respondents. In case of conventional farming it was assumed that farmers had no relationship to their cows. The fact that cows have '*no names just numbers*' served as proof.

In comparison, several respondents explained that in organically dairy farming farmers take more care of their cows. Some mentioned that these cows have names and that the milk yield plays not such a central role compared to conventional farming. It was also mentioned that organic farmers are not or not extremely profit-orientated. One participant said: '*It doesn't matter if the cow gives one liter less milk*'.

It was assumed that in organic farming cows would be kept '*naturally*' and '*mainly on meadows (...) in the evening they go into the stable*'. Therefore, cows have more space. Feed would be '*only natural feed*' that was described as primarily grass and hay and it was discussed if they would get concentrated feed at all. If so, given concentrated feed was perceived to be not genetically modified, without chemical additives and better controlled than conventional feed. Medicine would not be given prophylactically. Just in case of illness these cows would also receive medication, even antibiotics, but afterwards the milk would not be sold as organically. It was also expected that milk produced from these cows would be of a higher quality.

Table 1.
Perceived differences between organic and conventional dairy farming

	Conventionally	Organically
Farming	mainly factory farming less space, freedom to move never/rarely on meadows	less/no factory farming more space kept outside on meadows species appropriate
Feeding	primarily concentrate rarely green fodder genetically modified feed additives allowed less controlled	mainly grass and hay concentrate? not genetically modified additives forbidden well controlled organic feeding
Medication	prophylactic use antibiotics vaccination growths promoters hormones	no prophylactic use just in case of illness if used not sold as eco
Other facts mentioned	cows have no names farmers do not care output orientated many cows per farm cows have lots of stress	cows have names farmers care not output orientated less cows per farm

Asked for the pros and cons several aspects were raised. The main benefit of conventional dairy farming was seen in lower prices and the large choice of different products. It was argued that more people can be provided with milk and that life cycle assessment could be even better compared to the organic production. This was reasoned with higher milk yields of conventional farmers. Therefore, transportation routes would be shorter and less fuel needed. In contrast to the mentioned benefits several negative aspects were mentioned too: It was discussed that farms and milk are less controlled and the latter could easily contain residues of medication due to a lack of standards. As a consequence people could get ill. Other criticized points were bad housing conditions with less space (compared to organic dairy farming) and lots of stress.

Benefits of organic dairy farming were often those aspects that were harshly criticized in case of conventional dairy farming. It was mentioned that cows are kept '*more humanly*', that the milk yield is not such important and that housing conditions are more species appropriate. It was expected that milk of these cows is of better quality and tasty due to lack of residues and superior quality of feed. The most often raised negative issue of organic dairy farming, higher product prices, was also seen as an advantage: Some discussants mentioned that due to higher margins organic farmers would have higher incomes compared to conventional ones. But organic farming was also seen as more time consuming and the assumed high share of rogue traders were negatively mentioned too.

5 Conclusion

Dairy farming was perceived to be highly technical and rarely species appropriate. Main areas of concern, among others, were the lack of space and the prophylactic use of veterinary medical products. As this study focused solely on dairy cattle, results cannot be directly compared with findings of other studies regarding other animals' husbandries although similar aspects were addressed (compare for pig husbandry WEIBLE et al., 2013).

It became obvious that respondents knew negative aspects from pig or poultry production that were transferred to dairy farming. Especially the topics of preventive medical treatments and limitation of free movement were raised.

In some cases, organic farming was described with an extreme romantic view: Cows seemed to be kept

like in children's picture books or like 100 years ago and farmers seemed not to have any economic restrictions. A critical discussion if animal husbandry was species appropriate 100 years ago was totally missing. Another point becoming obvious during discussions was the confusion with animal welfare aspects. Mainly those aspects concerning animal welfare were mentioned when participants described differences between conventional and organic dairy farming.

Main areas of desirable improvements were more space per animals and, if possible, with free-range on meadows and regular monitoring carried out by vets. Coming to some preliminary implications based on this qualitative study the latter item is especially applicable to be implemented by farmers, agricultural associations or policy makers. However, whenever it comes to an implementation of further or new measures, it will be of special importance to develop these improvements "with the involvement of society" in a transparent way. Improvements have to be communicated to society to ensure the credibility and acceptance of those measures. In this special case to be open about the frequency of controls as well as about the sanctions in case of misconduct.

It seems that a proactive communication strategy on cows' needs and both types of dairy farming could be very helpful to correct the actual image on both sides: Conventionally dairy farming is often much better as perceived and also is organic farming not always that romantic and picture book-like as perceived. For example, there are no residues of antibiotics in conventional dairy products, and cows are not kept in boxes or generally without any freedom to move. On the other hand, it could also cause a scandal if citizens get to know that organic dairy farming is not like in a picture book: Even these farmers have to be output-orientated and cows are also kept in stables quite often and not solely on meadows. Another topic that has to be communicated is the difference between organic farming and animal welfare. Although these two aspects are quite similar in certain issues, it is of special importance to communicate the differences.

The presented qualitative research in this article delivers a differentiated picture on perceptions and expectations regarding dairy farming as well as on the perceived differences between organic and conventional dairy farming. A solely literature review or standardized survey would not have been provided information for that topic in detail like this explorative approach used in this study. But, of course, results are not representative. Therefore, an online-survey based on the outcome of the focus groups will be carried out in 2015.

References

- Andersen, L. (2011). Animal welfare and eggs – Cheap talk or money on the counter? *Journal of Agricultural Economics*, **62**: 565-584.
- Alvensleben, R. v. (2002). Neue Wege in der Tierhaltung: Verbraucheransichten und –einsichten. In: Kuratorium für Technik und Bauwesen in der Landwirtschaft e.V. (Hrsg.): Neue Wege in der Tierhaltung. Darmstadt: KTBL-Schrift 408.
- AMI (Agrarmarkt Informations-Gesellschaft) (2013): Markt Bilanz, Öko-Landbau 2013.
- AMI (Agrarmarkt Informations-Gesellschaft) (2014): Markt Bilanz Milch 2014.
- Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz (2013). Zeitreihe Pro-Kopf-Verbrauch der EU-Mitgliedstaaten von Milch-erzeugnissen. Siehe: <http://berichte.bmelv-statistik.de/DFT-9100080-0000.pdf>.
- Boogaard, B.K., B.B. Bock, S.J. Oosting, J.S.C. Wiskerke, and van der Zijpp, A.J. (2011). Social acceptance of dairy farming: The ambivalence between the two faces of modernity. *Journal of Agricultural and Environmental Ethics*, Jahrgang **24**, Nummer 3: 259-282.
- BMEL (2014). Verbrauch von Nahrungsmitteln je Kopf der Bevölkerung. <http://www.bmelv-statistik.de/index.php?id=139>
- Bundesverband der Ernährungswirtschaft (2013). Die Ernährungsindustrie in Zahlen 2013. <http://www.bve-online.de/themen/branche-und-markt/ernaehrungsindustrie-in-zahlen/aktuell-140523-001-ernaehrungsindustrie-2014>.
- Deutsche Landwirtschafts-Gesellschaft (2009). Image der Landwirte deutlich verbessert, Pressemitteilung 15.01.2009. <http://presse.dlg.org/publicArtikelDetail.do;jsessionid=909BAD40BD82154B4BB17DF72CA7570?artikelId=2189&spracheId=1&kategorieId=1&bereich=Aktuelles&type=pdf>. Accessed 5 December 2014.

- Eurobarometer (2005). Attitudes of consumers towards the welfare of farmed animals, Eurobarometer Spezial 229. Verfügbar unter: http://ec.europa.eu/food/animal/welfare/euro_barometer25_en.pdf.
- Eurobarometer (2007). Attitudes of EU citizens towards animal welfare, Eurobarometer Spezial 270. http://ec.europa.eu/public_opinion/archives/ebs/ebs_270_en.pdf. Accessed 5 December 2014.
- Finch, H., Lewis, J. (2003). Focus groups. In: Ritchie, J. and Lewis, J. (2003): Qualitative Research Practice, Sage Publications Ltd., London: 170-197.
- Harper, G., S. Henson (2001). Consumer Concerns about Animal Welfare and the Impact on Food Choice. Final Report. EU FAIR Project CT98-3678.
- Hellberg-Bahr, A., Steffen, N., and Spiller, A. (2012). Marketingpotentiale für Weidemilch. In: Hambrusch, J., Hoffmann, C., Kantelhardt, J., und Oedl-Wieser, T. (Hrsg.): Jahrbuch der Österreichischen Gesellschaft für Agrarökonomie. Wien: Facultas Verlag: 3-12.
- Kayser, M., Schlieker, K., and Spiller, A. (2012). Die Wahrnehmung des Begriffs „Massentierhaltung“ aus Sicht der Gesellschaft. In: *Berichte über Landwirtschaft*, Heft **90**, Nummer 3: 417-428.
- Krystallis, A., de Barcellos, M.D., Kügler, J.O., W. Verbeke, W., and Grunert, K.G. (2009). Attitudes of European citizens towards pig production systems. *Livestock Science*, Heft **126**: 46-56.
- Liljenstolpe, C. (2008). Evaluating animal welfare with Choice Experiments: An application to Swedish pig production. *Agribusiness*, Heft **24**: 67–84.
- Salamon, P. Bürgelt, Christoph-Schulz, I. (2014). Societal expectation towards structural change in agriculture. How can the sector cope with it? In: Rickert U., Schiefer G. (eds) Proceedings in system dynamics and innovation in food networks 2014: 491-502.
- SGS Fresenius (2011). Verbraucherstudie 2011 „Lebensmittelqualität & Verbrauchermacht.
- TNS Emnid (2012). Das Image der deutschen Landwirtschaft: Ergebnisse einer Repräsentativbefragung, März 2012. http://www.ima-agrar.de/fileadmin/redaktion/download/image-studie/2012/ima-imagestudie-landwirtschaft_charts-2012.pdf. Accessed 5 December 2014.
- Weible, D., Christoph-Schulz, I., and Salamon, P. (2013). Does the society perceive its own responsibility for modern pig production? In: Röcklinsberg, H.; Sandin, P. (Hrsg.). The ethics of consumption: the citizen, the market, and the law ; conference proceedings. Wageningen: Academic Publ.: 386-394.
- Weible D, Christoph-Schulz, I., and Salamon, P (2013): Does the society perceive its own responsibility for modern pig production? In: The ethics of consumption : the citizen, the market and the law: EurSafe 2013, Uppsala, Sweden, 11-14 September 2013. Wageningen: Wageningen Academic Publ.: 386-392.
- Wilson, V. (1997). Focus Groups: A useful qualitative method for educational research? *British Educational Research Journal*, **23**, 2: 209-224.
- Zander, K., Hamm, U. (2009). Consumer preferences for additional ethical attributes of organic food. *Food Quality and Preference*, **21**, 5:495-503.
- Zander, K., Isermeyer, F., Bürgelt, D., Christoph-Schulz, I., Salamon, P., and Weible, D. (2013): Erwartungen der Gesellschaft an die Landwirtschaft. Münster: Stiftung Westfälische Landschaft.