

Dauermann, Angelika; Enneking, Ulrich

Working Paper

Views from the country road: A qualitative study on the landscape aesthetic perception of dairy barns in the region of the Osnabrück Region (northwestern Germany)

Diskussionsbeitrag, No. 2303

Provided in Cooperation with:

Department for Agricultural Economics and Rural Development, University of Goettingen

Suggested Citation: Dauermann, Angelika; Enneking, Ulrich (2023) : Views from the country road: A qualitative study on the landscape aesthetic perception of dairy barns in the region of the Osnabrück Region (northwestern Germany), Diskussionsbeitrag, No. 2303, Georg-August-Universität Göttingen, Department für Agrarökonomie und Rurale Entwicklung (DARE), Göttingen

This Version is available at:

<https://hdl.handle.net/10419/279909>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



Views from the country road: A qualitative study on the landscape aesthetic perception of dairy barns in the region of the Osnabrück Region (northwestern Germany)

Angelika Dauermann^a, Ulrich Enneking^a

Fachgebiet Agrar- und Lebensmittelmarketing an der Fakultät für Agrarwissenschaften und Landschaftsarchitektur der Hochschule Osnabrück, Deutschland.

Kontakt: u.enneking@hs-osnabrueck.de

Department für Agrarökonomie und
Rurale Entwicklung
Universität Göttingen
D 37073 Göttingen
ISSN 1865-2697

Views from the country road: A qualitative study on the landscape aesthetic perception of dairy barns in the region of the Osnabrück Region (northwestern Germany)

Abstract

Aesthetic enjoyment and landscape beauty are increasingly recognized as significant attributes of cultural landscapes. Agriculture is an important integral part of the cultural landscape in many places. To date, however, there has been little research into the visual quality of agricultural landscapes – particularly of farm buildings. Consequently, this qualitative study focuses on local residents' emotional reactions to the visual impact of dairy barns as well as their subjective perceptions. The interviewees in the present study looked at various images of different dairy barn designs and dairy barns embedded in the landscape. The dairy barns shown were based on real-life dairy barns in the German agricultural region of Osnabrück in northwestern Germany. All 16 interviewees lived in the region at the time the study was conducted. The interviewees answered a questionnaire to reflect their perceptions and thoughts on the dairy barns. The evaluation shows that the quality of the landscape aesthetics of dairy farms is of importance to the interviewees. Being able to see cattle is one of the key factors contributing to a positive assessment of the landscape aesthetic quality of a dairy farm. Furthermore, this study shows that visual messages have a wide influence on the general perception of a farm. In fact, the analysis of the interviews conducted shows how numerous interpretations of how a farm is run can be derived from visual perception.

Keywords: Dairy barn design; dairy farming; agricultural landscape; qualitative research

1 Introduction

Germany's energy transition and the associated expansion of renewable energy sources (wind turbines, solar power installations, biogas production, etc.) have sparked controversial discussions about landscape aesthetics and the impact on the landscape of ecological aspects of renewable energy expansion over the last two decades. Wind turbine siting, the routing of power lines or increased cultivation of energy crops have repeatedly been the subject of scientific studies (Molina-Ruiz et al., 2011; Kühne, 2013; Herbes et al., 2015; Maehr, 2015). What we have learned from the field of renewable energy is that the acceptance of these technologies by the general public is also associated with the quality of the landscape aesthetic integration of these projects (Molina-Ruiz et al., 2011; Kühne, 2013; Maehr, 2015).

When it comes to agricultural buildings, the situation is very different, with research seldom

touching on the appearance of modern agricultural buildings and the landscape aesthetic integration of these agricultural buildings (Meino et al., 2016; Galama et al, 2020). Yet agriculture is an industry with a high visual presence in people's everyday lives. Agricultural buildings shape our landscape, particularly when these buildings are located outside residential areas. Here, agricultural buildings have a huge impact on the landscape (Heinrich and Kaufmann, 2005). Cross-country trips by car or bicycle or recreational activities such as hiking involve agriculture as a backdrop. In addition, for some people, agricultural regions are also their home and thus the immediate living environment – especially in the more densely populated countries of western Europe (Buijs et al., 2006; Tieskens et al., 2018). Agriculture – especially livestock farming – must continue to do more to address the conflicts of acceptance surrounding this issue (Christoph-Schulz et al., 2018). Dairy farming, an important part of Germany's economy, is also affected by these controversies (Christoph-Schulz et al., 2015; Kühl et al., 2019).

Central to these discussions are the environmental impacts of farming practices as well as animal welfare in livestock production (Christoph-Schulz et al, 2015; Moumen et al, 2016; Godfray et al, 2018; Kühl et al, 2019; Galama et al, 2020). That said, research into the increasing conflicts over acceptance in agriculture should also better reflect its aesthetic quality. More importantly, agricultural construction projects need to address their long-term impacts on the landscape – similar to the considerations made in the field of renewable energy. This is the key to making farming practices more acceptable. In fact, the visual perception of agriculture is a direct point of reference for the public in terms of how they relate to agriculture. (Weilacher, 2017; Leso et al., 2018; Dauermann and Enneking, 2019; Galama et al, 2020).

The present study therefore aims to address the question of how dairy barns are perceived aesthetically by local people and whether dairy barns in particular would be perceived differently if they had different exteriors and exterior design features. The study findings seek to provide insight into whether dairy farmers might be able to optimize social perception through targeted landscape planning designs as well as by embedding their dairy barn buildings into the landscape.

2 Background

Significance of German dairy production for the country's visual landscape

In 2020, a total of 33.2 million tonnes of milk were produced in Germany, making it the larg-

est producer of cow's milk in the European Union. Around 20 percent of the EU cow's milk is produced in Germany (BMEL, 2020; DBV, 2021). Dairy farming is the most important sector of Germany's agricultural industry. This is where the highest production revenue is generated, with more than 10 billion euros annually (BLE, 2021). Dairy farming shapes German agriculture despite ongoing structural change and the decreasing number of dairy farms. In Germany, one in four farms is still a dairy farm (Thünen Institute, 2021). Dairy farming therefore has a very significant impact on the landscape of rural areas in Germany and can be found all over Germany. Dairy farming is almost inevitably accompanied by the construction of dairy barn buildings (Thünen Institute, 2021). Dairy farms are located in virtually every German agricultural region, although there are certain regional dairy farming hubs on the North Sea coast and in the foothills of the Alps (Thünen Institute, 2021). The fact that these regional dairy farming hubs are also regions of Germany that are heavily frequented by tourists is of particular interest (National Atlas, 2013).

Moreover, the trend toward specialization and the increase in farm size have resulted in ever larger barns in recent decades. Another factor impacting the size of dairy barn buildings, however, is changes in animal husbandry practices. For example, buildings for the loose housing system that dominates in Germany are often very large (81 percent of German dairy farmers use loose housing for dairy cattle) (Heinrich & Kaufmann, 2005; Thünen Institute, 2021; Regierungspräsidium Tübingen, n.d.). These dairy farming barns undoubtedly shape the visual appearance of rural areas in Germany. The expansion of renewable energy sources has been extensively discussed by the research community from the point of view of landscape aesthetics. In contrast, the landscape aesthetic relevance of dairy farming and possible optimization options have barely been touched on by landscape planners in Germany and elsewhere (Galama, 2020). What is clear, however, is that agricultural developments also transform landscapes.

The cultural landscape and its multifunctional importance

In the multifunctional landscapes of Western Europe that are characterized by their densely populated regions, aesthetic qualities are becoming more and more important (Weilacher, 2017). Cultural landscapes are being increasingly recognized and valued as objects of aesthetic beauty alongside their role in food production (Buijs et al., 2006; Weilacher, 2017; Tieskens et al., 2018). In fact, the demand for attractive landscapes is on the rise, with the ever more urbanized populations of Western Europe turning to the countryside for local recreation and leisure activities. People do not seem to be primarily seeking pure nature but, rather, beautiful and accessible landscapes (Buijs et al., 2006; Weilacher, 2017; Tieskens et al., 2018). Scientific evaluations show that certain features of the cultural landscape – for

instance, grazing cows or flowers – are also aesthetically appealing to people in terms of local recreation activities (Tieskens et al., 2018).

Politicians and business developers alike are also becoming increasingly aware of the potential that lies in attractive scenic locations (Weilacher, 2017). For some sectors of the economy, landscape quality is crucial. One reason for this is that attractive residential areas can help attract quality employees to businesses in the region. Another reason is that business environments with attractive landscapes are important for marketing purposes (Weilacher, 2017). In light of this, knowledge of the different significance attributed to landscapes is absolutely essential (Tieskens et al., 2018). When it comes to understanding the topic's complexities, the field of conservation is unable to provide sufficient answers because it is about the well-being of species and ecosystems in the natural science sense. Instead, aesthetic perception is a landscape conservation issue (Pinto et al., 2006; Buijs et al., 2006; Haber, 2010). As regards the perception of landscapes, a distinction can be drawn between laymen's access and expert access. People with knowledge of and expertise in landscape structure tend to look at landscape perceptions on a cognitive level, whereas laymen mainly access landscapes aesthetically and emotionally (Tänzler, 2007). What we can conclude from this dichotomy is that when viewing arable land, people with a connection to agriculture go through thought processes about vegetation stages and plant protection, while for laypeople, sensory perceptions such as color contrasts or smells come to the fore.

In the Netherlands and France, we know that people living increasingly urban lives are becoming less and less attuned to the functional context of rural areas. Things such as food production in rural areas are seen and appreciated less often. Instead, people with urban lifestyles increasingly approach the countryside with notions of romance and wilderness. This development has become more evident since the 1990s. In this context, urban-minded viewers more often view agriculture nostalgically, while modern agriculture often leads to feelings of loss (Luginbühl, 2001; Buijs et al., 2006; Haber, 2010). We also know from scientific research findings that people tend to reject landscape changes, with the reinterpretation of landscapes posing a cognitive and emotional challenge for most (Kühne, 2013). This point needs to be borne in mind when we look at developments in the agricultural sector and current acceptance issues.

Development of agricultural building culture

In the past, local availability of building materials limited the design scope for new buildings. Furthermore, construction methods were not as complex and multifaceted as they are today. Instead, building culture was marked by high-quality and traditional regional craftsmanship.

This situation, typical of times gone by, was the basis for a certain process of harmonization of the building fabric of any given region and was the reason for the distinct character of regional building culture. Today, conversely, regional construction techniques are seldom found in the construction of stables and barns used in agricultural production. Instead, today's agricultural buildings are very similar in design irrespective of region, based on a standard building typology and built by specialized firms using materials sourced worldwide (Heinrich and Kaufmann, 2005; Torreggiani & Tassanari, 2012; Dauermann and Enneking, 2019; Regierungspräsidium Tübingen, n.d.). Cost control and labor efficiency are critical criteria in the construction of modern agricultural functional buildings (Heinrich and Kaufmann, 2005; Dauermann and Enneking, 2020; Galama et al, 2020). This results in a situation where factors such as design and how buildings fit into existing landscapes are often no longer given sufficient attention. Sheet metal and colors that are not typical in the relevant landscape are often used, The buildings seldom share similar design features and local traditions or surroundings are no longer incorporated into the designs (Heinrich and Kaufmann, 2005; Torreggiani & Tassanari, 2012; Galama et al, 2020; Regierungspräsidium Tübingen, n.d.).

3 Method

In order to generate findings on the landscape aesthetic perception of dairy barns, this study, which was carried out in the summer of 2021, conducted interviews with 16 test interviewees who were shown digital images of different types of dairy barn designs. Owing to the tense Covid situation in Germany at the time, the interviews were conducted using the Zoom communication platform and recorded as video files. The interviewees, who were recruited through an existing panel at Osnabrück University, included individuals from different age groups who reside in the Osnabrück region. The subjects were also not allowed to have an agricultural background, i.e., they were not allowed to be employed in the agricultural sector. None were allowed be undergoing agricultural training or to have completed agricultural studies. Anyone who had grown up on a farm was also excluded. These criteria were intended to rule out distorting influences resulting from extensive knowledge of this sector.

Table 1: List of interview participants

	Age	Gender	Profession
1	66	f	Banker
2	76	m	Educationalist
3	60	f	Psychologist
4	55	f	Technical draftswoman
5	24	f	Student
6	65	m	Businessman

7	60	f	Social education worker
8	37	m	Electrical engineer
9	54	m	Businessman
10	62	m	Computer scientist
11	48	f	Gardener
12	25	f	Research assistant Nutritional sciences
13	68	f	Teacher
14	61	f	Professional musician
15	35	f	Research assistant Market analysis
16	54	m	Businessman

Source: Author's list

This qualitative research design did not lead to representative results. However, it was possible to generate initial content-related approaches as to how dairy farms are perceived as landscape elements in general and how the design of the dairy barn buildings impact people's perception. To date, agricultural building culture and corresponding questions of perception have barely been mentioned in scientific research, accounting for the overall lack of a solid foundation of knowledge in this subject area. Qualitative approaches are particularly well-suited to the early phase of a largely unexplored field of research (Bitsch, 2005; Holzmüller and Buber, 2009). For our study design, we needed to bear in mind that when it comes to questions of building style and agriculture, the study subjects will be influenced by certain typical regional characteristics.

In the Osnabrück area, for instance, people are accustomed to the building styles of north-western Germany. With its high concentration of pig and poultry farms, the area surrounding the University City of Osnabrück is known for animal husbandry (Thünen Agricultural Atlas, 2022), although the region is also home to numerous dairy farms (Thünen Institute, 2021). The subjects interviewed can therefore be expected to be accustomed to seeing dairy farms. The Osnabrück region is an agricultural region in Lower Saxony, Germany's second biggest milk-producing region after Bavaria. Dairy herds in the region average 98 cows. A total of 86 percent of cows in Lower Saxony are Holstein Friesian black-and-white dairy cows. And 46 percent of cows in the northwest (in Lower Saxony) are grazed dairy cows. Furthermore, 93 percent of Lower Saxony's dairy cows are kept in loose housing (Thünen Institute, 2021; Milchland, 2021).

The abstract standardized representations of dairy cattle barns shown to the subjects as part of this study had a real reference to dairy cattle barns that can be found in the area surrounding the University City of Osnabrück in northwestern Germany. The different types of dairy

barn construction were selected on the basis of existing dairy cattle barns found in the Osnabrück region. Agricultural building experts were also consulted to ensure that the dairy barn designs shown were realistic. The standardized images of dairy cattle barns for approximately 90 dairy cows (measuring 28 meters wide by 32 meters long, 10 meters height) were created using the 3D image editing programs SketchUp 19, Lumion 9.5, and Photoshop CS6. A landscape architect helped with the implementation.

Photographic images of existing dairy barns could not be used because factors that might affect the perceptions of the interviewees – such as weather or individual yard space design – cannot be standardized. This was crucial for the focus to remain on how the interviewees perceived factors of the dairy barn design that had deliberately been changed. The study examines the effect of different barn façade material and façade colors (wooden façade, trapezoidal sheet façade) as well as of dairy barn exteriors that tie in with the historical architectural style of the Osnabrück region in particular (white half-timbering) or of northwestern Germany (clinker brick façade) (see Figure 1 below). We also analyzed the effect of different types of greening (hedges, loosely grouped trees) (see Figure 2), cows visible in the pen (see Figure 3) as well as a dairy barn with solar panels on the roof (see Figure 4).



Figure 1. Various materials and different colored façades used for the exterior of the barns (gray-blue trapezoidal sheet metal façade, wooden façade, red clinker brick façade, white half-timbered façade)

Picture source: Nina Klaucke (Landscape architect) and Angelika Dauermann



Figure 2. Types of greening – hedges and loosely grouped trees

Picture source: Nina Klaucke (Landscape architect) and Angelika Dauermann



Figure 3. Dairy barn with outdoor cattle pen and visible dairy cattle

Picture source: Nina Klaucke (Landscape architect) and Angelika Dauermann



Figure 4. Dairy barn with rooftop solar panels

Picture source: Nina Klaucke (Landscape architect) and Angelika Dauermann

The procedures involved in the qualitative method were previously tested with a number of people in a pretest. For the interview, the subjects were told to imagine they were driving or cycling along a route through the Osnabrück countryside (the local recreation area around the city of Osnabrück) and saw various dairy barns near the road. The next step was to show the interviewees different dairy barn pictures on a PC screen. They were then given a short period of time to have a look at the relevant picture and subsequently asked to describe the image they were viewing. What must be pointed out is that the interviewees only had a short time to situate each image in principle. In fact, they were expected to verbalize their thoughts after just a few seconds (about six to seven seconds). The reason for this prompt verbalization was to access instantaneous thought processes rather than structured, increasingly filtered and considered thoughts. This procedure is in line with the conceptual descriptions referring to the thinking aloud method by Konrad (2010).

After an initial situation phase and unprompted descriptions, the interviewees were asked specific questions about each dairy barn building shown. This was done with the aid of a guide. For example, they were asked whether any specific features could be seen in the dairy barn building shown. The interviewees were also asked to describe any particular feelings they had about the dairy barn building in the picture they were shown. They were asked how they felt about the type of farming associated with the building depicted. They were also asked their opinion about the landscape aesthetic quality of the respective dairy barn in the picture. In addition, there were questions related to individual pictures. For example, the importance of seeing animals was addressed, as was the interviewees' desire for transparency in relation to agricultural businesses. Once all the dairy barn pictures had been shown, general questions were also asked such as to how important the aesthetic quality of farms is in general to them. Another question posed was how the interviewees rated the aesthetic quality of farms and barns in the Osnabrück region compared to other regions in Germany and Central Europe which they had come across from travels or living there. Furthermore, personal data such as age, occupation, and place of birth were collected from the interviewees. The order in which the dairy barn pictures were shown to each interviewee was changed randomly in order to minimize distortions caused by the cumulative effect of seeing different content.

The interviews lasted approximately one hour on average. The audio tracks of the individual interviews were transcribed afterwards. A content analysis according to Mayring (2015) was then conducted to structure (code) the transcribed interviews and identify relevant utterances. The coding plan was developed prior to analyzing the interviews with reference to the interview guide and prior knowledge of the subject. Throughout the process of structuring the

interview material, however, additional codes were defined from the text material and existing codes refined. The content structuring process for the interview material in the present study was supported using the program MAXQDA. The main categories were the façade and material ranking, the greening concept, the importance of seeing animals, links to the type of agriculture and the statements on the quality of the agricultural landscape.

4 Results

Importance of visual quality of agricultural buildings

The analysis of the interview material indicates that the visual quality of agricultural buildings (examined here in relation to dairy barns) is important to the people living in the region. Our findings show that the visual appearance of agricultural buildings can affect the recreational character of landscapes both positively and negatively. Furthermore, it was found that the interviewees tended to make judgements about the type of agriculture associated with the dairy barn based on the visual appearance of the barn building. In the present study, a nuanced approach was taken in the examination of the interviewees' perceptions in order to identify the main trends that emerge in the perception of dairy barns.

Interviewees' conclusions based on external appearance of farms

During the interviews, some interviewees clearly stated that the external appearance of farm buildings had a bearing on whether or not they felt confident buying produce from the farm. For example, one interviewee compared this to gastronomy, pointing out that customers would also pay very close attention to hygiene and cleanliness; for instance, they would draw conclusions about the kitchen hygiene from the cleanliness of the restrooms. In the field of agriculture, this type of scenario would be similarly critical since it is also related to food consumption. It can thus be inferred from the interviews conducted that it is generally essential for agricultural businesses to have a clean and tidy appearance.

“Since food is usually produced on farms, the visual appearance is, of course, very important to me. So, farms that are how shall I put it? –, run-down, and where it's maybe also dirty on the farm, are not particularly confidence-inspiring. It's a bit like saying in the restaurant business that what the restroom looks like is probably the way it looks in the kitchen. If a farm is unkempt and doesn't make a visually appealing impression, I'd suspect that it looks similar in the barn and in the field or in the silo. I would imagine that other areas are also unkempt and this could very well mean the quality of the products produced there suffers as well.”

Farm character

The primary finding here is that the standardized dairy barn building shown in this experiment, which represents a dairy cowshed for a herd size of approximately 90 cows with exterior ventilation, was perceived positively overall by the interviewees in terms of its basic form. The open character of the dairy barn building gave the interviewees the impression that the farm was modern and geared toward animal welfare.

“So, I think it's a very modern barn. When I look through the bars on the right, I get the feeling this is an open cattle barn. But a very modern, well-organized farm.”

Perceptions of dairy barn façades

This qualitative study cannot claim to deliver representative results. By analyzing the interviews, however, what it can do is shed some light on current trends and provide possible starting points to help explain how agricultural buildings are perceived. With regard to the experiment conducted, the following can be said: The majority of the interviewees had a negative view of the dairy barn with the trapezoidal metal façade with the gray-blue color scheme. By way of contrast, the majority of the interviewees liked the wooden dairy barn, the dairy barn with the red brick façade, and the one with the half-timbered façade, although they ranked them in different order. The one conclusion that stands out, however, is the binary gap in perception between the three aforementioned barns (wooden façade, red brick façade, and half-timbered façade) and the gray-blue trapezoidal metal dairy barn, which was seen considerably more negatively than the other three barns.

The interviewees commented as follows on the façades shown:

“So, I would put the wooden dairy barn and the half-timbered one on one level. The brick barn comes next, and finally this gray-blue trapezoidal corrugated iron one.”

“Yes, first the half-timbered barn, then wood, then brick, then the corrugated iron.”

“In first place I'd put the wooden building, in second place the red brick building, in third place the half-timbered one, and what I found really awful to look at was this gray-blue tin building, but that's just from looking it.”

“The half-timbered building, then the clinker, I mean the brick building, I'd say. Then wood and finally metal.”

Opinions on the red brick dairy barn

The opinions expressed about the dairy barn with red clinker bricks and green gables indicate that the interviewees were familiar with this type of building. In fact, the look of this building was very well known to them. In addition, the appearance of this building was characterized as being typical of northwestern Germany and presented as a feature distinguishing it from buildings found in the southern German region. The interviewees considered red brick barns to be traditional and modern in equal measure.

“This one with red bricks and green gables – that’s also a northern German thing. You don’t often see that in southern Germany, for example.”

It can also be said that for a larger proportion of the interviewees the color green, which appears in the gable of the red brick building on the picture, blends in nicely with the landscape. It was argued that a green dairy barn would also go well with the colors in the surrounding area.

“It also blends in well with the landscape. I like that. As I said, the green always reinforces the – what would you call it? – integration effect, in my opinion, because it blends well with the color of the surroundings.”

Bricks continued to be considered a warm and natural building material. From this perspective, the red clinker brick dairy barn shown was seen as positive. With metal being associated with coldness and an unpleasant background noise, clinker was thought to be a better building material than metal for animal barns.

“Yes. Clinker is a material that is natural when the sun shines on it – a warm material. Yes, it’s just so natural because it’s baked clay. And metal is always cold and when you knock on it, it makes unpleasant noises.”

Opinions on the half-timbered façade

During the interviews, the dairy barn with the half-timbered façade met with many positive responses and associations. On the one hand, this building was described by the interviewees as having a typical farm look about it, meaning it was felt to be positive and familiar. As for the dairy barn with the half-timbered façade – half-timbering being described as a traditional building style in the Osnabrück region – the interviewees saw it as “preserving the architectural style,” a fact that some considered to be very positive. The half-timbered building

was also associated with “feelings of home.” Notions of this building being an ecologically managed farm were also expressed. Furthermore, the interviewees showed an awareness that half-timbering is an elaborate and expensive building style. The half-timbered dairy barn was thus also recognized as quite an achievement on the part of the agricultural builder.

“I think it's awesome that this is still done – even if it's more expensive than many of the other construction methods. Because, as I said, it preserves this slightly older but natural-looking design. The old style you used to have. Or used to see a lot. Back when farms were still built that way. And yes, I do find half-timbered houses really beautiful. There are quite a few lovely half-timbered buildings like these here in the Osnabrück region, too.”

The half-timbered dairy barn was increasingly associated with traditional values. Yet this did not mean the interviewees considered the farm to be retrograde. The fact that the regional traditional building style had been preserved also led the interviewees to perceive the farm as modern and forward-looking.

“I don't even know how to describe it. The farm is both conservative and forward-looking. So, I think this is a farmer who is able to combine the best of both worlds.”

What was particularly striking in the interviews conducted in this study was that only the half-timbered dairy barn was said to have an explicitly welcoming feel to it. The interviewees associated the half-timbered farm building with the likelihood of there being a farm shop or a place for people to stop for a break when out on a day trip or excursion. Another hypothesis was that the farmer in charge might be proud of his work and like to show off his farming.

“I could also somehow imagine a building like this having a farm shop or something. It has this feeling to it ... that you want to draw people in and that it's more than just a functional building. That's the impression you get from the façade.”

Conversely, there were also individual cases where negative views were expressed about the half-timbered dairy barn. These interviewees tended to be of the opinion that half-timbering was the architectural style of genuine historical buildings. New buildings in half-timbered designs were not considered authentic – and thus not fitting – by these interviewees.

“I said that about the half-timbered building. I think it's ridiculous because it's obviously a new building.”

Opinions on the trapezoidal metal façade

The gray-blue trapezoidal metal dairy barn shown was viewed predominantly very negatively. The color of the barn as well as the materials used triggered associations with industry among the interviewees. For instance, it was said that the dairy barn building could just as easily have been a car mechanic's shop. In fact, the industrial appearance of this dairy farm building did not appeal to a large number of interviewees.

"And this building looks technical. I find it hard to imagine animals in this building."

In some cases, the interviewees even suspected that this dairy barn was used for high-tech animal husbandry, where animals are not known to be treated particularly well. The materials used in the dairy barn shown were also considered cheap.

"I would tend to assume there are cars and machines in there rather than animals. And that's why it seems very cheap, not ecological at all."

A further point the interviewees made was that the building design had no recognition value in terms of suggesting it was used for agricultural purposes.

"Well, it doesn't fit into the landscape either and that's why I might not even see it as an agricultural building, even if there are tractors in it. But the term agriculture wouldn't come to mind."

Other interviewees, however, were not completely dismissive of the building. In these cases, it was said, for example, that there was nothing out of the ordinary about the building and that blue was also a nice color.

"I mean, I think the green is nicer but the blue façade wouldn't have bothered me either. It's still a nice color."

Opinions on the wooden barn

A relatively large number of interviewees were positive about the image of the wooden dairy barn they were shown. The opinions expressed here were often favorable. For instance, the design of the wooden dairy barn was described as being close to nature. The building was said to fit nicely into the landscape thanks to the use of wood as a construction material, which also creates a natural look. As one interviewee explained, wood comes from nature and it would be good if it was also used again in a natural environment.

"Excellent! I really like it, because I mean, wood comes from nature and is then going back to

nature again. So, I think that's fantastic."

Some also described the wooden dairy barn as modern, while other interviewees described it as having a traditional feel to it, although the overall assessment was positive.

"In principle, I think natural products are great for this kind of business. And it's natural to want to bring in a more modern touch with the use of simple wooden elements like this."

"And the building does also seem a bit, well, more original, more traditional. It also gives off a kind of homely feeling because the colors are so natural."

The wooden dairy barn also met with a positive response owing to what some interviewees described as the sustainable nature of wood as a construction material. In connection with the wooden barn, some interviewees mentioned that wood is easy to recycle and that the end-of-life phase of the buildings should also be taken into account.

"Yes, wood can be recycled very easily. (...) And ultimately, the buildings will be torn down again at some point and this construction material can be easily recycled again."

Furthermore, a few interviewees noted that the wooden dairy barn reminded them of Bavaria and the Alpine landscape. For example, they said that they were familiar with wooden dairy barns from vacations in Bavaria and other alpine regions.

"We're in Bavaria now."

When it comes to the associations connected with the wooden dairy barn, the interviewees tended to think of the link between ecology and agriculture. On multiple occasions, the interviewees said they thought the wooden barn was an ecological and animal-friendly dairy farm. This led them to conclude that the farmer had chosen an eco-friendly construction material and would therefore be more likely to practice ecological and animal-friendly farming.

"In fact, this is the first time I feel that this is ecological. Amazing! It's because of the wood. For the first time I have the impression that could also be an eco-farm. Cool."

The wooden dairy barn was not always seen in a positive light, however. In one case, it was said that the wooden dairy barn on the picture was not very nice to look at due to the boring uniform color scheme.

"I find it boring. I definitely preferred those with two colors – green and red – to complement one another."

Opinions on dairy barn greening

In addition to the four dairy barns with different façades, the interviewees were also shown two barns surrounded by greening. In one case, the image showed loosely grouped trees in front of the dairy barn, while the other showed hedges in front of the barn. These two types of greening led the interviewees to discuss a variety of different subjects and associations. This focused, on the one hand, on the landscape aesthetic character of the greening seen on the images. On the other hand, they evaluated the biodiversity and environmental advantages related to the different types of greening. The overriding opinion expressed by a large number of interviewees was that large buildings such as the dairy barns shown to them were too severe and upset the natural ecological balance. This in turn led to the conclusion that some kind of compensation was needed to restore the natural balance. Planting vegetation, for example, would create habitats for birds and insects, the interviewees said. In this regard, the two dairy barn greening options shown were considered to be positive.

“I mean, I think that it’s basically an attempt to somehow stay in harmony with nature. Or just to not exclude nature altogether.”

In some cases, however, the interviewees did not consider planting vegetation necessary to restore the natural balance disturbed by the large building; instead, they felt that the farmer was doing his part for the environment. In this interpretation, the characterization of the farmer responsible for the barn with greening was particularly positive.

“Because he has no benefit from the trees, except that they might break things up a bit, make it look a bit more pleasant. [...] So, from that perspective, I find it awesome that there are trees and that the farmer is doing his bit for the environment.”

Another recurrent opinion among the interviewees was that the two types of greening in fact created an artificial impression around the dairy barn environment. In these cases, the greenery shown was identified as an inauthentic landscape feature. Within this explanatory approach, the greening shown tended to be judged negatively by the interviewee.

“Well, I have to say in all honesty, I much prefer landscapes that are kind of wild. And this is artificially landscaped, not wild.”

Conversely, the interviewees also found that the greening shown embedded the dairy barn into the landscape harmoniously. In this regard, the greening shown was viewed positively, be it the trees, the hedge, or the grouped trees.

“But yes, it’s the trees that make the whole thing somehow seem a bit more harmonious.”

Although as far as the building goes, it actually makes no difference at all.”

Another subject that came up, especially in relation to the hedge shown in front of the dairy barn, was the question of transparency. Several interviewees reported that this dairy barn design gave no insight into the farm. In some cases, there were even suspicions about something negative being concealed behind the hedge. For instance, the interviewees believed there was something to hide or that inadequate animal husbandry was taking place behind closed doors. The interviews thus show that dense greening in front of farms can in fact lead to a lack of transparency.

“Yes, normally it’s nice to see all the green. But here I have the feeling that there’s a hedge in front to hide something. What am I not allowed to see here? There’s something I’m not supposed to see. Maybe the animals aren’t doing so well, or something is being covered up.”

Some interviewees also said that they found seeing cows or people working in agriculture a pleasant sight. This allowed them to see for themselves that everything is in order on the farm and have some insight into what is happening.

“Hmmm, I do actually think transparency is a good thing. So, as far as that’s concerned, I would maybe find that more important than looking at the hedge. [...] The fact that you also get a bit of an insight into the work they’re doing or maybe you can see a farmer, too, or how they feed the cows, or maybe just the animals themselves.”

On the other hand, however, some interviewees were also of the opinion that the hedge and the associated lack of transparency in fact ensures privacy, something which could be important for children or employees on the farm, for example. Another important point is that not everything can always be presentable and tidy – something that the interviewees described as normal in their interviews. In this context, some of the interviewees were quite understanding of the dense hedge preventing people from seeing into the farm directly.

“And if your intention is to just deliberately to hide something behind it ... maybe the barn, maybe the cattle, maybe the machinery, maybe the dirt or something – then I can understand that. Like I said, I would compare it to having a junk room at home. And maybe it’s a matter of privacy, too. Let’s say if your own children are running around and driving tractors – then maybe you just don’t want everyone gawking at them. That I can understand. Or who knows, if there are migrant workers or whatever running around, then somehow you’d like to maintain a bit of privacy. I can understand that.”

In relation to this notion of transparency, some interviewees described the loosely grouped

trees shown as more beneficial. Loosely grouped trees do not give the impression that there is something to hide, as a number of interviewees expressed in their interviews.

“He doesn’t want to hide anything like before. And he doesn’t not want to do anything either, but he also wants it to blend into the landscape somehow and look beautiful. Because you can see trees in the background, too. Looking at it, I feel that it all works so much better than if all you had was the barn.”

Opinions on the solar panels on the dairy barn roof

In relation to the image of the dairy barn with rooftop solar panels, the evaluation shows that the interviewees are very familiar with this type of dairy barn. In fact, they repeatedly stated that they often see agricultural buildings with solar panels on the roof.

“Solar panels. You actually see them a lot as well.”

During the interviews, the interviewees repeatedly expressed the opinion that installing solar panels on the roof of agricultural buildings was a good idea. Given that agricultural buildings have large roofs and that agricultural equipment needs energy, installing solar panels on agricultural buildings was seen to make good ecological sense.

“The roof area is huge, and it’s a good place to put a lot of solar panels. And if milking machines or other machines need a power source in the dairy barn, it can generate its own electricity. So, from an ecological point of view, I think it’s a great idea. Super idea.”

Another thought that came up in the interviews in relation to this type of dairy barn was that the farmer might be a young man who had identified a way to generate additional income. The opinion that farmers are a group of professionals that are able to easily recognize how additional money can be earned and where subsidies can be obtained was also expressed in connection with the dairy barn with rooftop solar panels.

“Yes, I could imagine that a generational change has perhaps already taken place here. That this is a relatively young farmer who is looking to the future. Whether or not solar panels on an agricultural building are an indication of an ecological mindset, I can’t say, because I can imagine that this is often a means to an end, just a way to generate more income.”

Opinions on the landscape aesthetic quality of rooftop solar panels differed significantly between the interviewees. On the one hand, solar roofing was described as being not particularly noticeable and, in terms of appearance, not much different to conventional dairy barn roofing.

“Doesn't bother me. Well, I don't see any difference. To me it looks the same as a normal roof. And, nowadays, these solar panels are barely noticeable; there's no frame and they just they just blend in. It basically looks just like any other roof surface.”

On the other hand, some interviewees were critical of the appearance of rooftop solar panels, although these opinions also differed, too. Despite their negative views on the visual quality element, the interviewees did appreciate the ecological and economic value of solar roofing on agricultural buildings.

“Yeah, I just don't like the look of them. That's what I think when I see things like this. But then I always have second thoughts: Oh, how ugly! And then: Ah, it's a good thing after all. (laughs).”

Opinions about the dairy barn with cattle pen

The image of the dairy barn with the concrete cattle pen and cows on view polarized the opinions of interviewees. In fact, this type of dairy barn prompted the strongest reactions among the interviewees and also triggered a discussion about animal welfare. Animal welfare in dairy farming proved to be a greater emotional challenge for almost all the interviewees and particularly so in relation to the image of the dairy barn with the cattle pen. Some of the interviewees responded positively to seeing the cattle pen beside the dairy barn, deducing that the animals could freely decide whether they wanted to stay in the barn or go outside.

“[...] on the positive side, the cows can go out into the pen and decide for themselves whether they want to go back inside or not.”

In contrast, a relatively large number of interviewees also saw the pen as very irritating. The concrete surface in the pen was perceived very negatively by some of the interviewees, who found concrete to be an unnatural environment for cows as there was no grazing. In addition, some expressed the opinion that there was too little space for dairy cattle in the pen shown.

“Apparently, the cows are on a concrete surface, which I find inappropriate. And the pen is not very big. And, besides, you don't know how many cattle can be kept there or are actually kept there. There are not very many there, so the animals do actually have the chance to move around, which I find quite good. What I don't find so good is the concrete surface.”

Some interviewees also saw the cattle pen to be something of a compromise. Despite saying that the cattle pen shown was not ideal in dairy farming, these interviewees nevertheless saw it as a means of improving animal welfare. For instance, they saw an improvement in dairy

cattle husbandry in contrast to forms of husbandry where cows are tethered. Concerning the cattle pen, the interviewees concluded that at least at the cows are not permanently tethered on this dairy farm.

“Obviously, the next best thing would probably still be for them to be able to run around freely in a meadow, but they are not tied up either and they do have this small pen, as I mentioned already. For these reasons, I would also rate it positively.”

Significance of visible cows

Another aspect that was often addressed in relation to the image of the dairy barn with the outdoor cattle pen was the importance of seeing cows in the landscape. This was a subject that was discussed a lot in the interviews. On the whole, it can be said that being able to see the dairy cattle is very important to all the interviewees. For example, in the case of the images of barns without cattle outside, the interviewees often mentioned that they could not see any cattle in the picture. The interviewees also emphasized that seeing dairy cows clearly made a positive contribution to the overall perception of the farm.

“It’s important for me to get a subjective first impression of the farm. When I see animals, I certainly perceive it very differently than when all I see is a building or whatever, like before [...]. So, that’s very, very positive for me in terms of perception.”

That said, the reasons for the significance of seeing cows in the landscape vary. The interviewees provided different explanations for this. One important reason for the interviewees is the idea of animal welfare. With dairy cows on view, you can convince yourself that the animals are doing well and that the cows have exercise.

“Because ... I mean, of course, I’ve also seen documentaries about how some animals are kept. And I know about the problem with muscle atrophy and, for that reason alone, I think it’s good if the animals can move about. And, of course, that appeals to me.”

In addition, some interviewees said they found it natural to see cows outdoors, saying it was natural to keep cows outdoors and that this was something they perceived positively.

“It’s good to see something in a natural environment every now and then that belongs there. So, it’s always great to see animals outdoors, whether it’s a squirrel in the backyard or cows in a meadow. I think it makes sense for animals to roam freely in a natural environment.”

In addition to the animal welfare issue, some interviewees also emphasized the high value that farm animals have for them as a landscape element. Some said, for example, that see-

ing the animals meant a distinction between city and country, meaning people would know immediately that they were in the countryside.

“Well, I'm not really an animal lover per se, but it's just a beautiful sight to behold. It's part of being in the countryside ... seeing cows standing around, seeing horses standing around – that's why you drive through the countryside and not through the city.”

In addition, some interviewees also associated seeing cows with a sense of being on vacation, spring or summer feelings, and childhood memories.

“It's important to me. It triggers a kind of – how can I put it? – like a feeling of being on vacation. It makes me think of Austria. Cows always run around freely there or there are lots of them outside in the countryside and now when I drive around here in the Osnabrück area, I find you can see cows here more often as well. They remind me a bit of Austria, and that's why I think it's nice.”

Some interviewees also argued that the sight of cows in the countryside was typical of the Osnabrück region, which is why they like to see them. People are used to this sight.

“It's just part and parcel of it for me. I think it's a normal thing to see. When I cycle somewhere – through the Osnabrück area now – and see farms, I also feel happy when I see cows in the meadow. They stand together in groups, they lie down, they graze. For me, that's simply part of being in the countryside.”

When it comes to seeing farm animals, some interviewees also drew comparisons between their home, the Osnabrücker Land region, and a neighboring region, the Oldenburger Münsterland, which is characterized by intensive pig and poultry farming. The Oldenburger Münsterland is characterized by factory farming – said some interviewees. Factory farming can be identified with the monotonous appearance of farms and the lack of farm animals in the countryside. In the agricultural landscape of Osnabrücker Land, in contrast, cows can be seen more often, leading people to conclude that there is less factory farming here, something that had very negative associations among the interviewees.

“I always find it better when I see animals running around somewhere. And to be honest, I don't really like it when I see all the poultry or pigsties in the Oldenburger Münsterland, for example, where there's not a single animal to be seen and they're all just white closed buildings. This has zero atmosphere for me, I'd say. For me, that's industry, whereas on a farm, you can see the animals.”

Another opinion about dairy cows in open pasture was that it would be nice to have different

breeds of cattle visible in the landscape. It can be concluded that monotony reduces the aesthetic quality of the landscape, while variety would appear to have more of an impact on how agriculture is perceived when evaluating agriculturally influenced recreational landscapes.

“I don’t like this monotony. If possible, it would be nice to occasionally see not only German black pied cattle in a meadow, but also Galloway cows or whatever you call all those other breeds. This variety is something I always find positive as well.”

Table 2. List of associations with different types of dairy barn images

<i>Dairy barn appearance or landscape integration</i>	<i>Key perceptions/associations</i>
Red clinker brick dairy barn	Traditional, modern, functional, familiar, different landscape to southern Germany, natural and warm building material, blends well into northern German landscape
Dairy barn with half-timbered façade	Historical building style in the Osnabrück region, preservation construction style, evoking feelings of home, elaborate and expensive building style, ecological farming, traditional yet modern/farsighted, direct marketing, inviting character, proud farmer, silly, not authentic in today’s world
Dairy barn with trapezoidal sheet metal façade	Industrial appearance, looks like a car locksmith shop, inappropriate appearance for a dairy farm, cheap, no warmth in animal husbandry, no recognition value in the direction of agriculture, gray-blue not a suitable color for the landscape, gray-blue not a disturbing color, Nordic appearance
Dairy barn with wooden façade	Natural building material, farmer close to nature, building material from nature, modern, traditional, sustainable building material, recyclable building material, typical building type for Alpine landscape, ecological farming, boring building view
Dairy barn with greening	Necessary in order to restore the natural balance following the construction of a barn, additional contribution by a motivated farmer, artificial elements, wild landscape elements preferred
Dairy barn with hedge greening	Lack of insight and transparency, privacy for children and working people on the farm
Dairy barn with greening in the form of trees	Enables transparency
Dairy barn building with solar panels on the roof	Familiar sight, sensible investment in light of energy-intensive machinery in agriculture, young farmer, knowledge of how to generate additional income, visually inconspicuous, visually disturbing but logical, solar panels on agricultural buildings are a good compromise and better than PV solar systems in the open countryside

Dairy barn with cattle pen/visible animals	Cows can freely decide where to be, unnatural concrete surface, no grass to eat, irritation, compromise, visible animals extremely positive (animal welfare-oriented husbandry, animals as an important part of the countryside, animals as emotion carriers)
--	---

Agricultural buildings in the landscape

Another aspect that was discussed during the interviews was how important the visual quality of agricultural buildings generally is to the interviewees. In this context, the most prominent opinion expressed by the interviewees was that agricultural estates have an effect on the quality of the landscape. A frequently expressed opinion was that beautiful farms are an enrichment to the landscape.

“[...] I like beautiful agricultural properties. No matter what region they’re in and no matter what architecture they have, I have a certain awareness for them; I like looking at them. I like driving across the countryside and seeing beautiful well-kept farms.”

Furthermore, some interviewees explained that they definitely had a very distinct perception of whether agricultural buildings have been built using high-quality materials or are really basic and constructed using cheap materials.

“So, when I’m driving through the countryside or wherever, I do notice when barns ... I mean, let’s put it this way, I associate it with whether they’ve been built on the cheap and then they seem more technical and functional to me, or else, if the buildings are built using materials that look more aesthetically pleasing and that are usually more expensive, I’d say they also look better, in my eyes.”

The analysis of the interviews shows that the interviewees find it important for agricultural properties to be well designed because they occupy a lot of land and are often on a larger scale than other buildings.

“Well, I think it’s important for them to have a nice design because they take up a lot of space, they’re big buildings, and if they blend into the landscape aesthetically, that’s something that’s very important to me. And I would very much welcome that.”

During the interviews, it was also said that the countryside is important to the urban population for excursions and local recreational activities. Agriculture has a duty here to facilitate these local recreational functions. This is the reason some interviewees reject intensive livestock farms and livestock farms that are very obviously livestock farms. In relation to this, some expressed the opinion that intensive animal husbandry had a strong emotional impact

on them and made local recreation more difficult.

“That’s important to me because I live in the city and like to make trips to the countryside, and I want to feel good there. And if I just drive past some big mass production sites, I find myself immediately thinking: Oh, the poor animals in there, they’re suffering. And, yes, I actually want to experience nature. And animals suffering is not nature.”

Another factor that was mentioned in relation to landscape aesthetic quality is the size of the farms. The analysis of the present study shows that large farms tend to be rejected more vehemently. One explanation for this is that these farms are believed to blend less well into the surrounding landscape or nature, as some interviewees put it.

“Medium-sized farms like this, I think to myself, ‘Oh yeah, this belongs here.’ I like that. But when there are these huge barns or giant fields, I have the feeling that it has nothing to do with nature at all. I don’t like that.”

The aesthetics of the newer agricultural buildings in the Osnabrück region were also commented on during the interviews. In some cases, the opinion was expressed that the newer buildings often have a functional design only and have no aesthetic value for the landscape. The older and traditional agricultural buildings, on the other hand, are beautiful to look at and enrich the surrounding landscape.

“So, whenever I’m driving around, whether it’s by car, whether it’s by bike, I notice the buildings that are beautiful, mostly older ones as well, and the new, more tech-oriented buildings, they stand out to me in a negative way. So, I have to say, so they’re not an asset to the landscape, not an asset to the aesthetics at all ... no, I can’t say that they are ... instead, they are purely practical in their design.”

Another thought that was expressed during the interviews was the idea that the standardized dairy barn shown in the images does not blend in well with the landscape. In addition, the interviewees said that it was possible to tell what farms were organic because they approached construction projects with greater consideration for the landscape and did not displace existing landscape elements as a result of their building projects. With the standardized dairy barn shown in the images, however, this consideration was not discernible. Some interviewees found consideration for existing landscape elements, such as old fruit trees or hedges, important, saying that agricultural properties would then look less artificial and more natural, which would be easier on the eye.

“With organic farms, it’s more often like this [...] because I think perhaps they don’t want to destroy certain things, they build around it – around a raspberry bush or some ancient pear tree that mustn’t be destroyed, or grandma’s favorite cherry tree or whatever. And so, they somehow build around these things.”

5 Discussion

Broad acceptance for the modern production methods of today’s agriculture can only be achieved among an increasingly urbanized population if agriculture takes urban recreational demands into account. Societies in Western Europe are increasingly using cultivated landscapes for local recreation and leisure activities. People do not seem to be primarily seeking nature in its purest form but beautiful and accessible landscapes. In this respect, the results of the present study are in line with the findings of the existing literature or previous studies. (Steg and Buijs, 2004; Buijs et al., 2006; Weilacher, 2017; Tieskens et al., 2018). The interview analysis conducted for the present study clearly shows that local recreation puts a lot of real demand on the agricultural region around Osnabrück. The thought process triggered by the research design – i.e., that the subjects were, among other things, picturing themselves cycling along the road in the Osnabrück region and imagining seeing agricultural estates – met with quite a response. Local recreation in the vicinity of the City of Osnabrück seems therefore to be rather common. People from the city seem to include the agricultural area around Osnabrück in their day-to-day lives. These processes, which were imitated during the experiment, seemed familiar to the interviewees.

What seems to be of outstanding importance for the interviewees in the context of local recreation is seeing cows or other farm animals. The reasons for this vary, as the results section of this study shows. The results illustrate that a relatively large number of the interviewees, those who see outdoor housing and/or the opportunity for the animals to be both inside and outside as an animal welfare-oriented attitude, welcome the sight of farm animals outside. By way of contrast, some of the interviewees clearly communicated that the great importance attached to seeing cows in the countryside or seeing farm animals in general also comes down to hedonistic and experience-oriented motives. For some of the interviewees, for instance, cows on view trigger feelings of spring and summer, memories of vacations, or childhood memories. In this respect, the results section of this study concurs with the existing literature. In the context of local recreation, seeing cattle is perceived as aesthetically pleasing, as evidenced by previous research by Tieskens et al. (2018). Against this background, the move away from pasture feeding towards continuous housing of dairy cows in Germany

must be seen as a critical development (Thünen Institute, 2021). Developments like this decrease the recreational value of agricultural landscapes. Furthermore, the results of the present study clearly show that cattle pens are not perceived as an equivalent substitute for pastures. A larger number of interviewees in this study were confounded by the cattle pen on the image. They failed to comprehend why the cows should be made to walk on a hard concrete surface instead of on a pasture and why the cows were not able to graze. This study therefore also indicates that grazing is understood holistically (including walking on grassland and grass ingestion by the cows when out to pasture) and that a concrete pen was not the way to resolve the issue of access to fresh air. The study thus provides evidence that in dairy farming cattle pens are generally not appreciated by consumers as a substitute for pasture.

The assessment of the different materials used in dairy barn construction (red bricks, half-timbering, wood, trapezoidal sheet metal) in the present study shows that when planning to build a dairy barn, farmers should factor in the conclusions that might be drawn about their agriculture practices from their choice of architectural design. Buildings constructed in the open countryside have a visual impact on the public and alter the aesthetics of the landscape (Heinrich and Kaufmann, 2005). Given that buildings often stand for decades, the visual impact of new dairy barns should be carefully considered by farmers who are looking to develop the land. The present study shows that the choice of architectural style evokes distinct positive or negative interpretations of the type of agriculture associated with the dairy barn building. For example, the wooden façade was more often associated with ecological farming methods, the half-timbered façade was perceived as inviting, and the trapezoidal sheet metal dairy barn was sometimes associated with industrial forms of farming.

Acceptance issues are particularly common in the dairy farming industry, one of the most important branches in German agriculture (Christoph-Schulz et al., 2015; Kühl et al., 2019). In the case of new dairy barn buildings, it would therefore be beneficial if farmers recognized that the appearance of the barn building is in fact an important tool in agricultural public relations. In addition to the materials used for the barn building and the color scheme, the greening around the dairy barn or how the barn building is integrated into the landscape would also seem to be key factors in the overall perception of the dairy barn, as illustrated in the results section of this study. On the one hand, an unobstructed view of the farm was important to some of the interviewees, while dense greening was sometimes equated with a lack of transparency in relation to the agricultural operations. On the other hand, some of the interviewees expressed the opinion that, when planning agricultural buildings, consideration should also be given to natural or traditional landscape elements.

Some interviewees emphasized the fact that agricultural construction plans should not inter-

fere too much with the existing landscape and that existing landscape elements should be integrated instead of being built over. In keeping with this, the results of the present study also show that highly function-oriented farms are sometimes seen less positively. Similar to what has already been described in the literature by Luginbühl (2001), Buijs et al. (2006) and Haber (2010), some interviewees in the present study experienced feelings of loss in connection with function-oriented agriculture. Furthermore, these statements may convey the population's call for agriculture to take a more mindful approach to conservation issues and landscape management issues in construction projects than has been seen in the past.

The present study provides initial information on the landscape aesthetic perception of dairy barn buildings in Germany. This qualitative study draws upon the outer appearances of dairy barn buildings that are commonly found in the region of Osnabrück. What must be taken into account, however, is that there are considerably more dairy barn designs than represented in the eight pictures used in the present study. To some degree, the combination of visual features in this study must also be critically examined. The trapezoidal sheet metal barn was shown in gray-blue, for example. The comments on the trapezoidal sheet metal design were predominantly negative. It would be interesting to establish whether a different color scheme would have resulted in different opinions on trapezoidal sheet metal. Given that the survey capacities of this qualitative study did not allow for a larger number of dairy barn pictures, this question and other such aspects could be examined in a quantitative study in the future.

Acknowledgements

This paper is part of the project “Animal Welfare in Intensive Livestock Production Systems Transformation processes of intensive animal husbandry.” Financial support from the Lower Saxony Ministry of Science and Culture is gratefully acknowledged.

References

- Bitsch, V. (2005): Qualitative Research: A Grounded theory Example and Evaluation In: Criteria. Journal of Agribusiness 23 (1): 75-91.
- BLE (Bundesanstalt für Landwirtschaft und Ernährung) (2021): Landwirtschaftliche Gesamtrechnung. URL: https://www.ble.de/SharedDocs/Pressemitteilungen/DE/2021/211214_Landwirtschaftliche_Gesamtrechnung.html, accessed Jan. 27, 2023.
- BMEL (Bundesministerium für Landwirtschaft und Ernährung) (2020): Entwicklungen Milchmarkt. URL: <https://www.bmel.de/DE/themen/landwirtschaft/agrarmaerkte/entwicklungen-milchmarkt-de.html>, accessed Jan. 27, 2023.
- Buijs, A., Pedrolí, B., and Y. Luginbühl (2006): From hiking through farmland to farming in a leisure landscape. Changing social perceptions of the European landscape. In: Landscape Ecology 21: 375-389.
- Christoph-Schulz, I., Weible, D. and P. Salamon (2015): Zwischen Heidi-Idyll und Agrarfabrik – zur Wahrnehmung der Milchviehhaltung. In: Jahrbuch der Österreichischen Gesellschaft für Agrarökonomie 24: 245-254.
- Christoph-Schulz, I., Hartmann, M., Kenning, P., Luy, J., Mergenthaler, M., Reisch, L. A., Roosen, J. and A. Spiller (2018): SocialLab – Nutztierhaltung im Spiegel der Gesellschaft. Erste Ergebnisse und Implikationen. In: Journal für Verbraucherschutz und Lebensmittelsicherheit 13 (2):145-236.
- Dauermann, A. and U. Enneking (2019): Die landwirtschaftliche Baukultur nachhaltiger gestalten und die kommunikative Wirkung der Bausubstanz erkennen. URL: https://orgprints.org/id/eprint/36227/1/Beitrag_303_final_a.pdf, accessed Nov. 20, 2022.
- DBV (Deutscher Bauernverband) (2021): Situationsbericht Landwirtschaft 2021. URL: <https://www.bauernverband.de/fileadmin/berichte/2021/index.html#0>, accessed Jan. 25, 2023.

- Galama P.J., Ouweltjes. W., Endres M.I., Sprecher, J.R., Leso, L., Kuipers, A., and M. Klopčič (2020): Symposium review: future of housing for dairy cattle. In: *Journal of Dairy Science* 103: 5759-5772.
- Godfray, H. C. J., Aveyard, P., Garnett, T., Hall, J. W., Key, T. J., Lorimer, J. and S.A. Jebb (2018): Meat consumption, health, and the environment. In: *Science* 361 (6399): eaam5324.
- Haber, W. 2010. Postindustrielle Kulturlandschaften. In: *Feldstudien - Zur neuen Ästhetik urbaner Landwirtschaft*: 16-22.
- Heinrich, A. and R. Kaufmann. 2005. Landwirtschaftliches Bauen und Landschaft. In: *AG-RARforschung* 12 (1): 28-33.
- Herbes, C., Jirka, E., Braun, J.P. and K. Pukall (2014): Der gesellschaftliche Diskurs um den „Maisdeckel“ vor und nach der Novelle des Erneuerbare-Energien-Gesetzes. In: *GAIA* 23(2): 100-108.
- Holzmüller, H. H. and R. Buber (2009): Optionen für die Marketingforschung durch die Nutzung qualitativer Methodologie und Methodik. In: *Optionen für die Qualitative Marktforschung, Konzepte – Methoden – Analysen*, 2. Aufl. Gabler, Wiesbaden: 2-20.
- Konrad, K. (2010): Lautes Denken. In: *Handbuch - Qualitative Forschung in der Psychologie*. VS Verlag für Sozialwissenschaften, Wiesbaden, Germany: 476-490
- Kühl, S., Gauly, S. and A. Spiller (2019): Analyzing public acceptance of four common husbandry systems for dairy cattle using a picture-based approach. In: *Livestock Science* 220: 196-204.
- Kühne, O. (2013): Landschaftsästhetik und regenerative Energien – Grundüberlegungen zu De- und Re-Sensualisierungen und inversen Landschaften. In: Gailing L, Leibenath M (eds) *Neue Energielandschaften – Neue Perspektiven der Landschaftsforschung*. Springer, Wiesbaden, Germany: 101-120.
- Leso, L., Conti, L., Rossi G. and M. Barbari (2018): Criteria of design for deconstruction applied to dairy cows housing: a case study in Italy. In: *Agronomy Research* 16 (3): 794-805

- Luginbühl Y. (2001): Paysage mode`le et mode`les de paysages. In: CREDOC, Ministe`re de l'environnement (2001). L'environnement, question sociale, Editions Odile Jacob, Paris, France: 49-56.
- Maehr, A. M., Watts, G. R., Hanratty, J., and D. Talmi (2015): Emotional response to images of wind turbines: A psychophysiological study of their visual impact on the landscape. *Landscape and Urban Planning* 142:71-79, <https://doi.org/10.1016/j.landurbplan.2015.05.011>.
- Maino, E., Benni, S., Torreggiani, D., Barbaresi, A. and P. Tassinari (2016): A quantitative physiognomic analysis of contemporary farm buildings to improve awareness in rural planning. In: *Transactions of the ASABE* 59 (2): 509-519.
- Mayring, P (2015): *Qualitative Inhaltsanalyse* (12). Beltz Verlag, Weinheim and Basel.
- Milchland (2021): Milchkühe in der Landwirtschaftszählung 2020. URL: <https://milchland.de/milchkuehe-in-der-landwirtschaftszaehlung-2020/>, accessed Jan. 15, 2023.
- Molina-Ruiz J., Martínez-S´anchez M.J., P´erez-Sirvent C., Tudela-Serrano M.L. and M.L.G. Lorenzo (2011): Developing and applying a GIS-assisted approach to evaluate visual impact in wind farms. In: *Renewable Energy* 36 (3): 1125-32.
- Moumen, A., Azizi, G., Chekroun, K.B. and M. Baghour (2016): The effects of livestock methane emission on the global warming: A review. In: *International Journal of Global Warming* 9: 229–253.
- Nationalatlas (2013): Tourismus in Deutschland. URL: http://aktuell.nationalatlas.de/tourismus-9_09-2013-0-html/, accessed Nov. 1, 2022.
- Pinto-Correia, T., Gustavsson, R. and J. Pirnat (2006): Bridging the gap between centrally defined policies and local decisions – Towards more sensitive and creative rural landscape management. In: *Landscape ecology* 21: 333-346.
- Regierungspräsidium Tübingen (n.d.): Landwirtschaftliches Bauen & Landschaft. URL: http://www.biberach.de/fileadmin/Dateien/Landratsamt/Amt_fuer_Bauen_Naturschutz/

Naturschutz/Informationen____Rechtsgrundlagen/rpt-LW-Bauen-Aussenbereich-regionalbroschuere-bw_01_1_.pdf, accessed Dec. 10, 2022.

Tänzler, D (2007): Politisches Charisma in der entzauberten Welt. In: Gostmann , Peter; Merz-Benz, Peter-Ulrich (Ed.). Macht und Herrschaft. Wiesbaden , 107–137 .

Thünen-Agraratlas (2022): Landwirtschaftliche Nutzung in Deutschland. <https://atlas.thuenen.de/webpace/agraratlas/agraratlas/index.html?LP=2>, accessed Dec. 5, 2022.

Thünen-Institut (2021): Steckbrief Milchviehhaltung 2021. URL: https://www.thuenen.de/media/ti-themenfelder/Nutztierhaltung_und_Aquakultur/Haltungsverfahren_in_Deutschland/Milchviehhaltung/Steckbrief_Milchkuehe.pdf, accessed Nov. 22, 2022.

Tieskens, K. F., Van Zanten, B. T., Schulp, C. J. E. and P. H. Verburg (2018): Aesthetic appreciation of the cultural landscape through social media: An analysis of revealed preference in the Dutch river landscape. In: Landscape and Urban Planning, 177: 128-137.

Weilacher, U. (2017): Neue Ästhetik urbaner Landwirtschaft. In: Eine Feldstudie. Welche Landwirtschaft braucht die Stadt? VS Verlag für Sozialwissenschaften, Wiesbaden, Germany, 179-194.



Diskussionspapiere

2000 bis 31. Mai 2006

Institut für Agrarökonomie

Georg-August-Universität, Göttingen

<u>2000</u>		
0001	Brandes, W.	Über Selbstorganisation in Planspielen: ein Erfahrungsbericht, 2000
0002	von Cramon-Taubadel, S. u. J. Meyer	Asymmetric Price Transmission: Factor Artefact?, 2000
<u>2001</u>		
0101	Leserer, M.	Zur Stochastik sequentieller Entscheidungen, 2001
0102	Molua, E.	The Economic Impacts of Global Climate Change on African Agriculture, 2001
0103	Birner, R. et al.	„Ich kaufe, also will ich?\": eine interdisziplinäre Analyse der Entscheidung für oder gegen den Kauf besonders tier- u. umweltfreundlich erzeugter Lebensmittel, 2001
0104	Wilkens, I.	Wertschöpfung von Großschutzgebieten: Befragung von Besuchern des Nationalparks Unteres Odertal als Baustein einer Kosten-Nutzen-Analyse, 2001
<u>2002</u>		
0201	Grethe, H.	Optionen für die Verlagerung von Haushaltsmitteln aus der ersten in die zweite Säule der EU-Agrarpolitik, 2002
0202	Spiller, A. u. M. Schramm	Farm Audit als Element des Midterm-Review : zugleich ein Beitrag zur Ökonomie von Qualitätssicherungssystemen, 2002
<u>2003</u>		
0301	Lüth, M. et al.	Qualitätssignaling in der Gastronomie, 2003
0302	Jahn, G., M. Peupert u. A. Spiller	Einstellungen deutscher Landwirte zum QS-System: Ergebnisse einer ersten Sondierungsstudie, 2003
0303	Theuvsen, L.	Kooperationen in der Landwirtschaft: Formen, Wirkungen und aktuelle Bedeutung, 2003

0304	Jahn, G.	Zur Glaubwürdigkeit von Zertifizierungssystemen: eine ökonomische Analyse der Kontrollvalidität, 2003
<u>2004</u>		
0401	Meyer, J. u. S. von Cramon-Taubadel	Asymmetric Price Transmission: a Survey, 2004
0402	Barkmann, J. u. R. Marggraf	The Long-Term Protection of Biological Diversity: Lessons from Market Ethics, 2004
0403	Bahrs, E.	VAT as an Impediment to Implementing Efficient Agricultural Marketing Structures in Transition Countries, 2004
0404	Spiller, A., T. Staack u. A. Zühlsdorf	Absatzwege für landwirtschaftliche Spezialitäten: Potenziale des Mehrkanalvertriebs, 2004
0405	Spiller, A. u. T. Staack	Brand Orientation in der deutschen Ernährungswirtschaft: Ergebnisse einer explorativen Online-Befragung, 2004
0406	Gerlach, S. u. B. Köhler	Supplier Relationship Management im Agribusiness: ein Konzept zur Messung der Geschäftsbeziehungsqualität, 2004
0407	Inderhees, P. et al.	Determinanten der Kundenzufriedenheit im Fleischerfachhandel
0408	Lüth, M. et al.	Köche als Kunden: Direktvermarktung landwirtschaftlicher Spezialitäten an die Gastronomie, 2004
<u>2005</u>		
0501	Spiller, A., J. Engelken u. S. Gerlach	Zur Zukunft des Bio-Fachhandels: eine Befragung von Bio-Intensivkäufern, 2005
0502	Groth, M.	Verpackungsabgaben und Verpackungslizenzen als Alternative für ökologisch nachteilige Einweggetränkeverpackungen? Eine umweltökonomische Diskussion, 2005
0503	Freese, J. u. H. Steinmann	Ergebnisse des Projektes 'Randstreifen als Strukturelemente in der intensiv genutzten Agrarlandschaft Wolfenbüttels', Nichtteilnehmerbefragung NAU 2003, 2005
0504	Jahn, G., M. Schramm u. A. Spiller	Institutional Change in Quality Assurance: the Case of Organic Farming in Germany, 2005
0505	Gerlach, S., R. Kennerknecht u. A. Spiller	Die Zukunft des Großhandels in der Bio-Wertschöpfungskette, 2005

<u>2006</u>		
0601	Heß, S., H. Bergmann u. L. Sudmann	Die Förderung alternativer Energien: eine kritische Bestandsaufnahme, 2006
0602	Gerlach, S. u. A. Spiller	Anwohnerkonflikte bei landwirtschaftlichen Stallbauten: Hintergründe und Einflussfaktoren; Ergebnisse einer empirischen Analyse, 2006
0603	Glenk, K.	Design and Application of Choice Experiment Surveys in So-Called Developing Countries: Issues and Challenges,
0604	Bolten, J., R. Kennerknecht u. A. Spiller	Erfolgsfaktoren im Naturkostfachhandel: Ergebnisse einer empirischen Analyse, 2006 (entfällt)
0605	Hasan, Y.	Einkaufsverhalten und Kundengruppen bei Direktvermarktern in Deutschland: Ergebnisse einer empirischen Analyse, 2006
0606	Lülfs, F. u. A. Spiller	Kunden(un-)zufriedenheit in der Schulverpflegung: Ergebnisse einer vergleichenden Schulbefragung, 2006
0607	Schulze, H., F. Albersmeier u. A. Spiller	Risikoorientierte Prüfung in Zertifizierungssystemen der Land- und Ernährungswirtschaft, 2006
<u>2007</u>		
0701	Buchs, A. K. u. J. Jasper	For whose Benefit? Benefit-Sharing within Contractual ABC-Agreements from an Economic Perspective: the Example of Pharmaceutical Bioprospection, 2007
0702	Böhm, J. et al.	Preis-Qualitäts-Relationen im Lebensmittelmarkt: eine Analyse auf Basis der Testergebnisse Stiftung Warentest, 2007
0703	Hurlin, J. u. H. Schulze	Möglichkeiten und Grenzen der Qualitäts-sicherung in der Wildfleischvermarktung, 2007
Ab Heft 4, 2007:		Diskussionspapiere (Discussion Papers), Department für Agrarökonomie und Rurale Entwicklung Georg-August-Universität, Göttingen (ISSN 1865-2697)
0704	Stockebrand, N. u. A. Spiller	Agrarstudium in Göttingen: Fakultätsimage und Studienwahlentscheidungen; Erstsemesterbefragung im WS 2006/2007
0705	Bahrs, E., J.-H. Held u. J. Thiering	Auswirkungen der Bioenergieproduktion auf die Agrarpolitik sowie auf Anreizstrukturen in der Landwirtschaft: eine partielle Analyse bedeutender

		Fragestellungen anhand der Beispielregion Niedersachsen
0706	Yan, J., J. Barkmann u. R. Marggraf	Chinese tourist preferences for nature based destinations – a choice experiment analysis
<u>2008</u>		
0801	Joswig, A. u. A. Zühlsdorf	Marketing für Reformhäuser: Senioren als Zielgruppe
0802	Schulze, H. u. A. Spiller	Qualitätssicherungssysteme in der europäischen Agri-Food Chain: Ein Rückblick auf das letzte Jahrzehnt
0803	Gille, C. u. A. Spiller	Kundenzufriedenheit in der Pensionspferdehaltung: eine empirische Studie
0804	Voss, J. u. A. Spiller	Die Wahl des richtigen Vertriebswegs in den Vorleistungsindustrien der Landwirtschaft – Konzeptionelle Überlegungen und empirische Ergebnisse
0805	Gille, C. u. A. Spiller	Agrarstudium in Göttingen. Erstsemester- und Studienverlaufsbefragung im WS 2007/2008
0806	Schulze, B., C. Wocken u. A. Spiller	(Dis)loyalty in the German dairy industry. A supplier relationship management view Empirical evidence and management implications
0807	Brümmer, B., U. Köster u. J.-P. Loy	Tendenzen auf dem Weltgetreidemarkt: Anhaltender Boom oder kurzfristige Spekulationsblase?
0808	Schlecht, S., F. Albersmeier u. A. Spiller	Konflikte bei landwirtschaftlichen Stallbauprojekten: Eine empirische Untersuchung zum Bedrohungspotential kritischer Stakeholder
0809	Lülfs-Baden, F. u. A. Spiller	Steuerungsmechanismen im deutschen Schulverpflegungsmarkt: eine institutionenökonomische Analyse
0810	Deimel, M., L. Theuvsen u. C. Ebbeskotte	Von der Wertschöpfungskette zum Netzwerk: Methodische Ansätze zur Analyse des Verbundsystems der Veredelungswirtschaft Nordwestdeutschlands
0811	Albersmeier, F. u. A. Spiller	Supply Chain Reputation in der Fleischwirtschaft
<u>2009</u>		
0901	Bahlmann, J., A. Spiller u. C.-H. Plumeyer	Status quo und Akzeptanz von Internet-basierten Informationssystemen: Ergebnisse einer empirischen Analyse in der deutschen Veredelungswirtschaft

0902	Gille, C. u. A. Spiller	Agrarstudium in Göttingen. Eine vergleichende Untersuchung der Erstsemester der Jahre 2006-2009
0903	Gawron, J.-C. u. L. Theuvsen	„Zertifizierungssysteme des Agribusiness im interkulturellen Kontext – Forschungsstand und Darstellung der kulturellen Unterschiede“
0904	Raupach, K. u. R. Marggraf	Verbraucherschutz vor dem Schimmelpilzgift Deoxynivalenol in Getreideprodukten Aktuelle Situation und Verbesserungsmöglichkeiten
0905	Busch, A. u. R. Marggraf	Analyse der deutschen globalen Waldpolitik im Kontext der Klimarahmenkonvention und des Übereinkommens über die Biologische Vielfalt
0906	Zschache, U., S. von Cramon-Taubadel u. L. Theuvsen	Die öffentliche Auseinandersetzung über Bioenergie in den Massenmedien - Diskursanalytische Grundlagen und erste Ergebnisse
0907	Onumah, E. E.,G. Hoerstgen-Schwark u. B. Brümmer	Productivity of hired and family labour and determinants of technical inefficiency in Ghana's fish farms
0908	Onumah, E. E., S. Wessels, N. Wildenhayn, G. Hoerstgen-Schwark u. B. Brümmer	Effects of stocking density and photoperiod manipulation in relation to estradiol profile to enhance spawning activity in female Nile tilapia
0909	Steffen, N., S. Schlecht u. A. Spiller	Ausgestaltung von Milchlieferverträgen nach der Quote
0910	Steffen, N., S. Schlecht u. A. Spiller	Das Preisfindungssystem von Genossenschaftsmolkereien
0911	Granoszewski, K.,C. Reise, A. Spiller u. O. Mußhoff	Entscheidungsverhalten landwirtschaftlicher Betriebsleiter bei Bioenergie-Investitionen - Erste Ergebnisse einer empirischen Untersuchung -
0912	Albersmeier, F., D. Mörlein u. A. Spiller	Zur Wahrnehmung der Qualität von Schweinefleisch beim Kunden
0913	Ihle, R., B. Brümmer u. S. R. Thompson	Spatial Market Integration in the EU Beef and Veal Sector: Policy Decoupling and Export Bans
<u>2010</u>		
1001	Heß, S., S. von Cramon-Taubadel u. S. Sperlich	Numbers for Pascal: Explaining differences in the estimated Benefits of the Doha Development Agenda
1002	Deimel, I., J. Böhm u. B. Schulze	Low Meat Consumption als Vorstufe zum Vegetarismus? Eine qualitative Studie zu den Motivstrukturen geringen Fleischkonsums

1003	Franz, A. u. B. Nowak	Functional food consumption in Germany: A lifestyle segmentation study
1004	Deimel, M. u. L. Theuvsen	Standortvorteil Nordwestdeutschland? Eine Untersuchung zum Einfluss von Netzwerk- und Clusterstrukturen in der Schweinefleischerzeugung
1005	Niens, C. u. R. Marggraf	Ökonomische Bewertung von Kindergesundheit in der Umweltpolitik - Aktuelle Ansätze und ihre Grenzen
1006	Hellberg-Bahr, A., M. Pfeuffer, N. Steffen, A. Spiller u. B. Brümmer	Preisbildungssysteme in der Milchwirtschaft -Ein Überblick über die Supply Chain Milch
1007	Steffen, N., S. Schlecht, H-C. Müller u. A. Spiller	Wie viel Vertrag braucht die deutsche Milchwirtschaft?- Erste Überlegungen zur Ausgestaltung des Contract Designs nach der Quote aus Sicht der Molkereien
1008	Prehn, S., B. Brümmer u. S. R. Thompson	Payment Decoupling and the Intra – European Calf Trade
1009	Maza, B., J. Barkmann, F. von Walter u. R. Marggraf	Modelling smallholders production and agricultural income in the area of the Biosphere reserve “Podocarpus - El Cóndor”, Ecuador
1010	Busse, S., B. Brümmer u. R. Ihle	Interdependencies between Fossil Fuel and Renewable Energy Markets: The German Biodiesel Market
<u>2011</u>		
1101	Mylius, D., S. Küest, C. Klapp u. L. Theuvsen	Der Großvieheinheitenschlüssel im Stallbaurecht - Überblick und vergleichende Analyse der Abstandsregelungen in der TA Luft und in den VDI-Richtlinien
1102	Klapp, C., L. Obermeyer u. F. Thoms	Der Vieheinheitenschlüssel im Steuerrecht - Rechtliche Aspekte und betriebswirtschaftliche Konsequenzen der Gewerblichkeit in der Tierhaltung
1103	Göser, T., L. Schroeder u. C. Klapp	Agrarumweltprogramme: (Wann) lohnt sich die Teilnahme für landwirtschaftliche Betriebe?
1104	Plumeyer, C.-H., F. Albersmeier, M. Freiherr von Oer, C. H. Emmann u. L. Theuvsen	Der niedersächsische Landpachtmarkt: Eine empirische Analyse aus Pächtersicht

1105	Voss, A. u. L. Theuvsen	Geschäftsmodelle im deutschen Viehhandel: Konzeptionelle Grundlagen und empirische Ergebnisse
1106	Wendler, C., S. von Cramon-Taubadel, H. de Haen, C. A. Padilla Bravo u. S. Jrad	Food security in Syria: Preliminary results based on the 2006/07 expenditure survey
1107	Prehn, S. u. B. Brümmer	Estimation Issues in Disaggregate Gravity Trade Models
1108	Recke, G., L. Theuvsen, N. Venhaus u. A. Voss	Der Viehhandel in den Wertschöpfungsketten der Fleischwirtschaft: Entwicklungstendenzen und Perspektiven
1109	Prehn, S. u. B. Brümmer	“Distorted Gravity: The Intensive and Extensive Margins of International Trade”, revisited: An Application to an Intermediate Melitz Model
<u>2012</u>		
1201	Kayser, M., C. Gille, K. Suttorp u. A. Spiller	Lack of pupils in German riding schools? – A causal-analytical consideration of customer satisfaction in children and adolescents
1202	Prehn, S. u. B. Brümmer	Bimodality & the Performance of PPML
1203	Tangermann, S.	Preisanstieg am EU-Zuckermarkt: Bestimmungsgründe und Handlungsmöglichkeiten der Marktpolitik
1204	Würriehausen, N., S. Lakner u. Rico Ihle	Market integration of conventional and organic wheat in Germany
1205	Heinrich, B.	Calculating the Greening Effect – a case study approach to predict the gross margin losses in different farm types in Germany due to the reform of the CAP
1206	Prehn, S. u. B. Brümmer	A Critical Judgement of the Applicability of ‘New New Trade Theory’ to Agricultural: Structural Change, Productivity, and Trade
1207	Marggraf, R., P. Masius u. C. Rumpf	Zur Integration von Tieren in wohlfahrtsökonomischen Analysen
1208	S. Lakner, B. Brümmer, S. von Cramon-Taubadel, J. Heß, J. Isselstein, U. Liebe, R. Marggraf, O. Mußhoff, L. Theuvsen, T. Tschardtke, C. Westphal u. G. Wiese	Der Kommissionsvorschlag zur GAP-Reform 2013 - aus Sicht von Göttinger und Witzenhäuser Agrarwissenschaftler(inne)n

1209	Prehn, S., B. Brümmer u. T. Glauben	Structural Gravity Estimation & Agriculture
1210	Prehn, S., B. Brümmer u. T. Glauben	An Extended Viner Model: Trade Creation, Diversion & Reduction
1211	Salidas, R. u. S. von Cramon-Taubadel	Access to Credit and the Determinants of Technical Inefficiency among Specialized Small Farmers in Chile
1212	Steffen, N. u. A. Spiller	Effizienzsteigerung in der Wertschöpfungskette Milch ? -Potentiale in der Zusammenarbeit zwischen Milcherzeugern und Molkereien aus Landwirtssicht
1213	Mußhoff, O., A. Tegtmeier u. N. Hirschauer	Attraktivität einer landwirtschaftlichen Tätigkeit - Einflussfaktoren und Gestaltungsmöglichkeiten
<u>2013</u>		
1301	Lakner, S., C. Holst u. B. Heinrich	Reform der Gemeinsamen Agrarpolitik der EU 2014 - mögliche Folgen des Greenings für die niedersächsische Landwirtschaft
1302	Tangermann, S. u. S. von Cramon-Taubadel	Agricultural Policy in the European Union : An Overview
1303	Granoszewski, K. u. A. Spiller	Langfristige Rohstoffsicherung in der Supply Chain Biogas : Status Quo und Potenziale vertraglicher Zusammenarbeit
1304	Lakner, S., C. Holst, B. Brümmer, S. von Cramon-Taubadel, L. Theuvsen, O. Mußhoff u. T.Tscharntke	Zahlungen für Landwirte an gesellschaftliche Leistungen koppeln! - Ein Kommentar zum aktuellen Stand der EU-Agrarreform
1305	Prechtel, B., M. Kayser u. L. Theuvsen	Organisation von Wertschöpfungsketten in der Gemüseproduktion : das Beispiel Spargel
1306	Anastassiadis, F., J.-H. Feil, O. Musshoff u. P. Schilling	Analysing farmers' use of price hedging instruments : an experimental approach
1307	Holst, C. u. S. von Cramon-Taubadel	Trade, Market Integration and Spatial Price Transmission on EU Pork Markets following Eastern Enlargement
1308	Granoszewski, K., S. Sander, V. M. Aufmkolk u.	Die Erzeugung regenerativer Energien unter gesellschaftlicher Kritik : Akzeptanz von Anwohnern

	A. Spiller	gegenüber der Errichtung von Biogas- und Windenergieanlagen
2014		
1401	Lakner, S., C. Holst, J. Barkmann, J. Isselstein u. A. Spiller	Perspektiven der Niedersächsischen Agrarpolitik nach 2013 : Empfehlungen Göttinger Agrarwissenschaftler für die Landespolitik
1402	Müller, K., Mußhoff, O. u. R. Weber	The More the Better? How Collateral Levels Affect Credit Risk in Agricultural Microfinance
1403	März, A., N. Klein, T. Kneib u. O. Mußhoff	Analysing farmland rental rates using Bayesian geoaddivitive quantile regression
1404	Weber, R., O. Mußhoff u. M. Petrick	How flexible repayment schedules affect credit risk in agricultural microfinance
1405	Haverkamp, M., S. Henke, C., Kleinschmitt, B. Möhring, H., Müller, O. Mußhoff, L., Rosenkranz, B. Seintsch, K. Schlosser u. L. Theuvsen	Vergleichende Bewertung der Nutzung von Biomasse : Ergebnisse aus den Bioenergieregionen Göttingen und BERTA
1406	Wolbert-Haverkamp, M. u. O. Musshoff	Die Bewertung der Umstellung einer einjährigen Ackerkultur auf den Anbau von Miscanthus – Eine Anwendung des Realoptionsansatzes
1407	Wolbert-Haverkamp, M., J.-H. Feil u. O. Musshoff	The value chain of heat production from woody biomass under market competition and different incentive systems: An agent-based real options model
1408	Ikinger, C., A. Spiller u. K. Wiegand	Reiter und Pferdebesitzer in Deutschland (Facts and Figures on German Equestrians)
1409	Mußhoff, O., N. Hirschauer, S. Grüner u. S. Pielsticker	Der Einfluss begrenzter Rationalität auf die Verbreitung von Wetterindexversicherungen : Ergebnisse eines internetbasierten Experiments mit Landwirten
1410	Spiller, A. u. B. Goetzke	Zur Zukunft des Geschäftsmodells Markenartikel im Lebensmittelmarkt
1411	Wille, M.	„Manche haben es satt, andere werden nicht satt“ : Anmerkungen zur polarisierten Auseinandersetzung um Fragen des globalen Handels und der Welternährung
1412	Müller, J., J. Oehmen, I. Janssen u. L. Theuvsen	Sportlermarkt Galopprennsport : Zucht und Besitz des Englischen Vollbluts

2015

1501	Hartmann, L. u. A. Spiller	Luxusaffinität deutscher Reitsportler : Implikationen für das Marketing im Reitsportsegment
1502	Schneider, T., L. Hartmann u. A. Spiller	Luxusmarketing bei Lebensmitteln : eine empirische Studie zu Dimensionen des Luxuskonsums in der Bundesrepublik Deutschland
1503	Würriehausen, N. u. S. Lakner	Stand des ökologischen Strukturwandels in der ökologischen Landwirtschaft
1504	Emmann, C. H., D. Surmann u. L. Theuvsen	Charakterisierung und Bedeutung außerlandwirtschaftlicher Investoren : empirische Ergebnisse aus Sicht des landwirtschaftlichen Berufsstandes
1505	Buchholz, M., G. Host u. Oliver Mußhoff	Water and Irrigation Policy Impact Assessment Using Business Simulation Games : Evidence from Northern Germany
1506	Hermann, D., O. Mußhoff u. D. Rüter	Measuring farmers' time preference : A comparison of methods
1507	Riechers, M., J. Barkmann u. T. Tschardtke	Bewertung kultureller Ökosystemleistungen von Berliner Stadtgrün entlang eines urbanen-periurbanen Gradienten
1508	Lakner, S., S. Kirchweber, D. Hopp, B. Brümmer u. J. Kantelhardt	Impact of Diversification on Technical Efficiency of Organic Farming in Switzerland, Austria and Southern Germany
1509	Sauthoff, S., F. Anastassiadis u. O. Mußhoff	Analyzing farmers' preferences for substrate supply contracts for sugar beets
1510	Feil, J.-H., F. Anastassiadis, O. Mußhoff u. P. Kasten	Analyzing farmers' preferences for collaborative arrangements : an experimental approach
1511	Weinrich, R., u. A. Spiller	Developing food labelling strategies with the help of extremeness aversion
1512	Weinrich, R., A. Franz u. A. Spiller	Multi-level labelling : too complex for consumers?
1513	Niens, C., R. Marggraf u. F. Hoffmeister	Ambulante Pflege im ländlichen Raum : Überlegungen zur effizienten Sicherstellung von Bedarfsgerechtigkeit
1514	Sauter, P., D. Hermann u. O. Mußhoff	Risk attitudes of foresters, farmers and students : An experimental multimethod comparison

<u>2016</u>		
1601	Magrini, E., J. Balie u. C. Morales Opazo	Price signals and supply responses for stable food crops in SSAS countries
1602	Feil, J.-H.	Analyzing investment and disinvestment decisions under uncertainty, firm-heterogeneity and tradable output permits
1603	Sonntag, W. u. A. Spiller	Prozessqualitäten in der WTO : Ein Vorschlag für die reliable Messung von moralischen Bedenken
1604	Wiegand, K.	Marktorientierung von Reitschulen – zwischen Vereinsmanagement und Dienstleistungsmarketing
1605	Iking, C. M. u. A. Spiller	Tierwohlbewusstsein und –verhalten von Reitern : Die Entwicklung eines Modells für das Tierwohlbewusstsein und –verhalten im Reitsport
1606	Zinngrebe, Yves	Incorporating Biodiversity Conservation in Peruvian Development : A history with different episodes
1607	Balié, J., E. Magrini u. C. Morales Opazo	Cereal Price Shocks and Volatility in Sub-Saharan Africa : what does really matter for Farmers' Welfare?
1608	Spiller, A., M. von Meyer-Höfer u. W. Sonntag	Gibt es eine Zukunft für die moderne konventionelle Tierhaltung in Nordwesteuropa?
1609	Gollisch, S., B. Hedderich u. L. Theuvsen	Reference points and risky decision-making in agricultural trade firms : A case study in Germany
1610	Cárcamo, J. u. S. von Cramon-Taubadel	Assessing small-scale raspberry producers' risk and ambiguity preferences : evidence from field-experiment data in rural Chile
1611	García-Germán, S., A. Romeo, E. Magrini u. J. Balié	The impact of food price shocks on weight loss : Evidence from the adult population of Tanzania
<u>2017</u>		
1701	Vollmer, E. u. D. Hermann, O. Mußhoff	The disposition effect in farmers' selling behavior – an experimental investigation
1702	Römer, U., O. Mußhoff, R. Weber u. C. G. Turvey	Truth and consequences : Bogus pipeline experiment in informal small business lending
1703	Römer, U. u. O. Mußhoff	Can agricultural credit scoring for microfinance institutions be implemented and improved by weather data?
1704	Gauly, S., S. Kühl u. A. Spiller	Uncovering strategies of hidden intention in multi-stakeholder initiatives : the case of pasture-raised milk

1705	Gauly, S., A. Müller u. A. Spiller	New methods of increasing transparency : Does viewing webcam pictures change peoples' opinions towards modern pig farming?
1706	Bauermeister, G.-F. u. O. Mußhoff	Multiple switching behavior in different display formats of multiple price lists
1707	Sauthoff, S., M. Danne u. O. Mußhoff	To switch or not to switch? – Understanding German consumers' willingness to pay for green electricity tariff attributes
1708	Bilal, M., J. Barkmann u. T. Jamali Jaghdani	To analyse the suitability of a set of social and economic indicators that assesses the impact on SI enhancing advanced technological inputs by farming households in Punjab Pakistan
1709	Heyking, C.-A. von u. T. Jamali Jaghdani	Expansion of photovoltaic technology (PV) as a solution for water energy nexus in rural areas of Iran; comparative case study between Germany and Iran
1710	Schueler, S. u. E. M. Noack	Naturschutz und Erholung im Stadtwald Göttingen: Darstellung von Interessenskonflikten anhand des Konzeptes der Ökosystemleistungen
<u>2018</u>		
1801	Danne, M. u. O. Mußhoff	Producers' valuation of animal welfare practices: Does herd size matter?
1802	Danne, M., O. Mußhoff u. M. Schulte	Analysing the importance of glyphosate as part of agricultural strategies – a discrete choice experiment
1803	Fecke, W., M. Danne u. O. Mußhoff	E-commerce in agriculture – The case of crop protection product purchases in a discrete choice experiment
1804	Viergutz, Tim u. B. Schulze-Ehlers	The use of hybrid scientometric clustering for systematic literature reviews in business and economics
1805	Schulze Schwering, D. u. A. Spiller	Das Online-Einkaufsverhalten von Landwirten im Bereich landwirtschaftlicher Betriebsmittel
1806	Hänke, H. et al.	Socio-economic, land use and value chain perspectives on vanilla farming in the SAVA Region (north-eastern Madagascar) : The Diversity Turn Baseline Study (DTBS)
1807	Wille, S. C., B. Barklage, A. Spiller u. M. von Meyer-Höfer	Challenging Factors of Farmer-to-Consumer Direct Marketing : An Empirical Analysis of German Livestock Owners
1808	Wille, S. C., A. Spiller u. M. von Meyer-Höfer	Lage, Lage, Lage? : Welche Rolle spielt der Standort für die landwirtschaftliche Direktvermarktung?

1809	Peth, D. u. O. Mußhoff	Comparing Compliance Behaviour of Students and Farmers : Implications for Agricultural Policy Impact Analysis
1810	Lakner, S.	Integration von Ökosystemleistungen in die I. Säule der Gemeinsamen Agrarpolitik der EU (GAP) – die Wirkung der ökologischen Vorrangfläche als privates oder öffentliches Gut?
1811	Fecke, W.	Online-Einkauf von Pflanzenschutzmitteln: Ein Discrete Choice Experiment mit landwirtschaftlichen Unternehmern in Deutschland
1812	Schulze-Ehlers, B.	Schlussbericht des Projekts „TransKoll“ - „Transparenz und Transformation in der regionalen Ernährungswirtschaft. Kollaborative Ansätze für mehr Nachhaltigkeit vom Rohstoff bis zum Endkonsumenten
1813	Buchholz, M., D. Peth u. O. Mußhoff	Tax or Green Nudge? An Experimental Analysis of Pesticide Policies in Germany
<u>2019</u>		
1901	Schaak, H. u. O. Mußhoff	Public preferences for livestock presence in pasture landscapes – A Latent Class Analysis of a Discrete Choice Experiment in Germany
1902	Möllmann, J., M. Buchholz, W. Kölle u. O. Mußhoff	Do remotely-sensed vegetation health indices explain credit risk in agricultural microfinance?
1903	Schütz, A., W. Sonntag u. Achim Spiller	Environmental Enrichment in pig husbandry – Consumer comparative assessment of different housing elements based on a pictorial survey
1904	Vollmer, T. u. S. von Cramon-Taubadel	The influence of Brazilian exports on price transmission processes in the coffee sector: a Markov-switching approach
1905	Michels, M., V. Bonke u. O. Mußhoff	Understanding the adoption of crop protection smartphone apps - An application of the Unified Theory of Acceptance and Use of Technology
1906	Reithmayer, C., M. Danne u. O. Mußhoff	Societal attitudes towards in ovo gender determination as an alternative to chick culling
1907	Reithmayer, C., M. Danne u. O. Mußhoff	Look at that! – The effect pictures have on consumer preferences for in ovo gender determination as an alternative to culling male chicks

1908	Aragie, E., J. Balié u. E. Magrini	Does productivity level influence the economic impacts of price support policies in Ethiopia?
<u>2020</u>		
2001	Busch, G. u. A. Spiller	Warum wir eine Tierschutzsteuer brauchen - Die Bürger-Konsumenten-Lücke
2002	Huchtemann, J.-P.	Unternehmerische Neigung in der Landwirtschaft – Einstellungen von Studierenden der Agrarwissenschaften in Deutschland
2003	Busch, G., E. Bayer, A. Gunarathne et al.	Einkaufs- und Ernährungsverhalten sowie Resilienz des Ernährungssystems aus Sicht der Bevölkerung Ergebnisse einer Studie während der Corona-Pandemie im April 2020
2004	Busch, G., E. Bayer, S. Iweala, C. Mehlhose, C. Rubach, A. Schütz, K. Ullmann u. A. Spiller	Einkaufs- und Ernährungsverhalten sowie Resilienz des Ernährungssystems aus Sicht der Bevölkerung : Eine Studie während der Corona-Pandemie im Juni 2020 ; Ergebnisse der zweiten Befragung
2005	Lemken, D.	When do defaults stick and when are they ethical? – taxonomy, systematic review and design recommendations
<u>2021</u>		
2101	Graskemper, V., J.-H. Feil	Values of Farmers – Evidence from Germany
2102	Busch, G., E. Bayer, S. Iweala, C. Mehlhose, A. Risius, C. Rubach,, A. Schütz, K. Ullmann u. A. Spiller	Einkaufs- und Ernährungsverhalten sowie Resilienz des Ernährungssystems aus Sicht der Bevölkerung: Eine Studie während der Corona-Pandemie im
2103	Steinhübel, L., A. Wenzel, P. Hulamani, S. von Cramon-Taubadel u. N. M. Mason	The role of space and time in the interaction of farmers' management decisions and bee communities: Evidence from South India
2104	Purushotham, A., A. Aiyar u. S. von Cramon-Taubadel	Dietary transition and its relationship with socio-economic status and peri-urban obesity
2105	Berger, J., B. Brümmer, D.-D. Doe Fionka u. T. Kopp	Sugar Market Policies in the EU and International Sugar Trade

2023

2301	Duden, C., F. Offermann u. O. Mußhoff	Comparing for modelling farm risk management decision with a focus on extreme weather losses
2302	Hüttel, S., S. Hess	Lessons from the p-value and the replication crisis for “open Q science” – the editor’s perspective or. will the revolution devour its children?



Diskussionspapiere

2000 bis 31. Mai 2006:

Institut für Rurale Entwicklung

Georg-August-Universität, Göttingen)

Ed. Winfried Manig (ISSN 1433-2868)

32	Dirks, Jörg J.	Einflüsse auf die Beschäftigung in nahrungsmittelverarbeitenden ländlichen Kleinindustrien in West-Java/Indonesien, 2000
33	Keil, Alwin	Adoption of Leguminous Tree Fallows in Zambia, 2001
34	Schott, Johanna	Women's Savings and Credit Co-operatives in Madagascar, 2001
35	Seeberg-Elberfeldt, Christina	Production Systems and Livelihood Strategies in Southern Bolivia, 2002
36	Molua, Ernest L.	Rural Development and Agricultural Progress: Challenges, Strategies and the Cameroonian Experience, 2002
37	Demeke, Abera Birhanu	Factors Influencing the Adoption of Soil Conservation Practices in Northwestern Ethiopia, 2003
38	Zeller, Manfred u. Julia Johannsen	Entwicklungshemmnisse im afrikanischen Agrarsektor: Erklärungsansätze und empirische Ergebnisse, 2004
39	Yustika, Ahmad Erani	Institutional Arrangements of Sugar Cane Farmers in East Java – Indonesia: Preliminary Results, 2004
40	Manig, Winfried	Lehre und Forschung in der Sozialökonomie der Ruralen Entwicklung, 2004
41	Hebel, Jutta	Transformation des chinesischen Arbeitsmarktes: gesellschaftliche Herausforderungen des Beschäftigungswandels, 2004

42	Khan, Mohammad Asif	Patterns of Rural Non-Farm Activities and Household Access to Informal Economy in Northwest Pakistan, 2005
43	Yustika, Ahmad Erani	Transaction Costs and Corporate Governance of Sugar Mills in East Java, Indonesia, 2005
44	Feulefack, Joseph Florent, Manfred Zeller u. Stefan Schwarze	Accuracy Analysis of Participatory Wealth Ranking (PWR) in Socio-economic Poverty Comparisons, 2006



Die Wurzeln der **Fakultät für Agrarwissenschaften** reichen in das 19. Jahrhundert zurück. Mit Ausgang des Wintersemesters 1951/52 wurde sie als siebente Fakultät an der Georgia-Augusta-Universität durch Ausgliederung bereits existierender landwirtschaftlicher Disziplinen aus der Mathematisch-Naturwissenschaftlichen Fakultät etabliert.

1969/70 wurde durch Zusammenschluss mehrerer bis dahin selbständiger Institute das **Institut für Agrarökonomie** gegründet. Im Jahr 2006 wurden das Institut für Agrarökonomie und das Institut für Rurale Entwicklung zum heutigen **Department für Agrarökonomie und Rurale Entwicklung** zusammengeführt.

Das Department für Agrarökonomie und Rurale Entwicklung besteht aus insgesamt neun Lehrstühlen zu den folgenden Themenschwerpunkten:

- Agrarpolitik
- Betriebswirtschaftslehre des Agribusiness
- Internationale Agrarökonomie
- Landwirtschaftliche Betriebslehre
- Landwirtschaftliche Marktlehre
- Marketing für Lebensmittel und Agrarprodukte
- Soziologie Ländlicher Räume
- Umwelt- und Ressourcenökonomik
- Welternährung und rurale Entwicklung

In der Lehre ist das Department für Agrarökonomie und Rurale Entwicklung führend für die Studienrichtung Wirtschafts- und Sozialwissenschaften des Landbaus sowie maßgeblich eingebunden in die Studienrichtungen Agribusiness und Ressourcenmanagement. Das Forschungsspektrum des Departments ist breit gefächert. Schwerpunkte liegen sowohl in der Grundlagenforschung als auch in angewandten Forschungsbereichen. Das Department bildet heute eine schlagkräftige Einheit mit international beachteten Forschungsleistungen.

Georg-August-Universität Göttingen
Department für Agrarökonomie und Rurale Entwicklung
Platz der Göttinger Sieben 5
37073 Göttingen
Tel. 0551-39-4819
Fax. 0551-39-12398

Mail: bibliol@gwdg.de

Homepage : <http://www.uni-goettingen.de/de/18500.html>



Die Wurzeln der **Fakultät für Agrarwissenschaften** reichen in das 19. Jahrhundert zurück. Mit Ausgang des Wintersemesters 1951/52 wurde sie als siebente Fakultät an der Georgia-Augusta-Universität durch Ausgliederung bereits existierender landwirtschaftlicher Disziplinen aus der Mathematisch-Naturwissenschaftlichen Fakultät etabliert.

1969/70 wurde durch Zusammenschluss mehrerer bis dahin selbständiger Institute das **Institut für Agrarökonomie** gegründet. Im Jahr 2006 wurden das Institut für Agrarökonomie und das Institut für Rurale Entwicklung zum heutigen **Department für Agrarökonomie und Rurale Entwicklung** zusammengeführt.

Das Department für Agrarökonomie und Rurale Entwicklung besteht aus insgesamt neun Lehrstühlen zu den folgenden Themenschwerpunkten:

- Agrarpolitik
- Betriebswirtschaftslehre des Agribusiness
- Internationale Agrarökonomie
- Landwirtschaftliche Betriebslehre
- Landwirtschaftliche Marktlehre
- Marketing für Lebensmittel und Agrarprodukte
- Soziologie Ländlicher Räume
- Umwelt- und Ressourcenökonomik
- Welternährung und rurale Entwicklung

In der Lehre ist das Department für Agrarökonomie und Rurale Entwicklung führend für die Studienrichtung Wirtschafts- und Sozialwissenschaften des Landbaus sowie maßgeblich eingebunden in die Studienrichtungen Agribusiness und Ressourcenmanagement. Das Forschungsspektrum des Departments ist breit gefächert. Schwerpunkte liegen sowohl in der Grundlagenforschung als auch in angewandten Forschungsbereichen. Das Department bildet heute eine schlagkräftige Einheit mit international beachteten Forschungsleistungen.

Georg-August-Universität Göttingen
Department für Agrarökonomie und Rurale Entwicklung
Platz der Göttinger Sieben 5
37073 Göttingen
Tel. 0551-39-4819
Fax. 0551-39-12398
Mail: biblio1@gwdg.de
Homepage : <http://www.uni-goettingen.de/de/18500.html>