



Department für Agrarökonomie
und RURALE Entwicklung

2303

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)

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ISSN 1865-2697

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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 Klauke (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)
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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-

ferre 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.

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