

Exploring value frameworks in the moral deliberation on animal biotechnology

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Abstract

Over the past decades, the development of animal biotechnology in the Netherlands has been accompanied by extensive public debate. However, this debate has been largely framed as a legal discussion, omitting the cultural values that drive the various social actors. Consequently, these actors find themselves repeatedly trapped in a “ritual dance” against licensing procedures, in stead of effective moral deliberation. In order to respond more adequately, the Ministry of Agriculture, Nature conservation and Food safety (LNV) aimed to better understand the various ways Dutch citizens attach moral value to animals. Therefore, an interactive focus group method was developed to obtain in-depth, qualitative knowledge of the existing frames of reference and value orientations in the reflection on animals, which affect public attitudes towards animal biotechnology. The use of homogeneous profession or lifestyle-oriented groups enabled participants to deliberate freely in a secure setting. The participants worked along a structured 3 hour program on the identification and exploration of their ideas, using their own language, associations and categorisations. The fact that the participants themselves explored the value concepts that constituted their specific moral frameworks was a central aspect of this interactive approach. As a result of 13 focus groups, four different value frameworks were delineated that each convey a typical way in which animals are positioned and valued. Knowledge of the differences between these value frameworks and the legal framing of the biotechnology debate provides constructive options to reopen dialogue (and to avoid frustrating dead ends) in the moral deliberation on animal biotechnology.

1. Introduction

Since its introduction in the early 1980s, the development of animal biotechnology in the Netherlands has been accompanied by extensive public debate. In this debate a plurality of perspectives has always been present. Different stories are told that each express a different vision on the animal, technology, and the relation between humans and animals. Such a vision is of course part of a larger worldview, a set of assumptions about physical and social reality. In this paper we focus on the reflection on animals. More precisely, we focus on the interactive methodology we have developed to investigate the moral value frameworks at the base of the various ways of reflection. Their presence to a large extent influences form and content of the public debate in the Netherlands. Knowledge of the in-depth structure of underlying moral value frameworks can offer constructive possibilities to facilitate a process of moral deliberation on animal biotechnology.

Why is in-depth knowledge of value frameworks important to the public debate on animal biotechnology? The answer lies in the character of the current debate. Since 1997 the Dutch government recognizes the ‘intrinsic value’ of animals as the central tenet of their regulatory policy. Despite this effort to incorporate the concern for animals in the legislation on animal

biotechnology, values are not the central theme of discussion. Although they do of course operate in the background, they are not deliberated explicitly. The Dutch debate about animal biotechnology has been largely framed as a legal discussion rather than a process of moral deliberation. One of the main reasons is the opacity of meaning of the 'intrinsic value' concept. In the public arena a diversity of cultural and moral values is found. Different social actors refer to different animal values when they use the concept of 'intrinsic value' to express their concerns about animals (Brom 1999; De Cock Buning 1999). The floating meanings of the 'intrinsic value' concept hamper moral deliberation because they fail to provide a conceptual framework to structure public debate. Therefore, the only possible structure of the Dutch public debate is legal hegemony. It is the one available framework for social actors to meet for discussion (Paula 2001). Because violation of their ethical values can only be disputed within a juridical context, these actors find themselves repeatedly trapped in a "ritual dance" against licensing procedures. The legal framework does not provide the appropriate grips to engage in an in-depth moral discussion about values. It does not contain the proper concepts and language to do so.

So what exactly has been going wrong? Paula (Paula 2004) argues that the underlying value conflict is not articulated nor deliberated. According to Paula, in order to engage in a social dialogue about animal biotechnology a new policy strategy is needed: *policy as learning*. This strategy aims at the creation of a new and shared vision on what the problem actually is through a process of mutual learning (see also (Dunn 1981); (Hisschemöller 2001)). A first step in this process is the identification and articulation of the value conflicts between various social actors. This means listening to what citizens have to say. In a mutual learning process moral frames of reference are not imposed on the public by governments or philosophers. They ascend from the public (encompassing a plurality of values) to the political and academic arena.

2. The interactive exploration of value frameworks

The interactive methodology we present here aims to contribute to this process, ultimately to transform the public discussion of animal biotechnology into a moral dialogue in which values are deliberated. This article proposes an answer to the question how we can articulate the existing value conflicts in the Dutch public debate about animal biotechnology in a bottom-up approach. We have focused on the exploration of animal values, although also human values and technology values play a role in this debate. We describe the adapted focus group methodology we have developed to explore the various value frameworks that are in possible conflict with one another. The following research questions will be addressed. To what extent is this a suitable tool of investigation to explore value frameworks? What are suitable inclusion criteria to select participants and how do they relate to the Dutch public debate? How are the in-depth structured value frameworks related to the discourses that actually figure in the Dutch public debate?

3. The use of focus groups

Involving the public in policy-making about animal biotechnology means listening to what citizens have to say. We were interested in the diversity of value frameworks. Therefore, we chose to look at the widest range of interested publics and to discuss the broader moral concerns. The participants in this study were explicitly addressed as citizens, members of the Dutch democratic society in which animal biotechnology is developing. One of the pre-assumptions of this research project was the idea that unprofessionalized citizens did indeed have an important contribution to make in the moral deliberation of animal biotechnology, since the discussion is about values that we all exhibit.

In cross-national studies of European consumer attitudes towards genetically modified food it was observed that an individual's opinions and beliefs about animal biotechnology are deeply embedded in more general attitude domains like the attitude towards nature and the attitude towards technology (Bredahl 1999), (Bredahl 2001). Also, values, beliefs and ideals are among other factors dependent on their context of expression (Potter 1996). From a discourse analytical perspective the meaning of value concepts is seen as emerging in the process of social interaction (Potter and Wetherell 1987); (Bunningham 1995)). When people talk about their perceptions of animals they will do so in highly complex ways. (Waterton 1999)) have argued that values, beliefs and ideals, i.e. the frameworks we set out to explore, are generally expressed in relation to a relevant social context and also as a process of negotiation of trust. They are actively negotiated and constructed during the course of interaction with others. Therefore, according to these authors, research into the meaning structure of values, beliefs and ideals needs a more reflexive research framework than is offered by surveys or individual interviews. Adopting this perspective, we feel that the value frameworks underlying public perceptions of animal biotechnology in the Netherlands can at best be investigated by a close examination of the social interaction process through which the meaning of values is constructed. This way, it is possible to explore the in-depth structure of values and worldviews, ultimately articulating the existing value conflicts in this public debate.

Because of the importance of social interaction as the site of construction and negotiation of meaning, we have used a particular type of group interview, called 'focus groups'. They are distinguished from ordinary group interviews by the explicit recognition of group interaction as a crucial part of the research process. The group is 'focused' in that it involves some kind of collective activity (Barbour and Kitzinger 1999). They are also 'focused' in the sense that a selective set of individuals discusses a specific topic from their own experience (Morgan 1997). Usually, they are set up as once-only meetings, that take up to 3 hours. The recommended number of participants varies between 5-12 participants (Greenbaum 1998). Data derived from focus group discussions relies to a large extent on the interactions between participants themselves (Barbour and Kitzinger 1999). As Kitzinger puts it, the 'group work ensures that priority is given to the respondents' hierarchy of importance, *their* language and concepts, *their* frameworks for understanding the world' (Kitzinger 1994). The objective of this research project was to articulate the underlying value conflict in the public debate on animal biotechnology. This entails listening what citizens themselves have to say. The use of focus groups in our study allowed participants to reconstruct their own frames of reference while reflecting and deliberating on animals with others. These frameworks involve the concepts, beliefs and ideals about animals that people personally value. Our qualitative research design aims at understanding the various meanings participants themselves assign to their own lifeworlds and experiences. Following a grounded theory approach we aim at the inductive development of theoretical concepts from the ways our participants themselves order their thoughts and experiences (Glaser and Strauss 1967).

4. Creating a conversational context

In this research process we aimed at encompassing diversity as well as *in-depth* exploration of ideas about animals. In order to enable this process, it was of great importance that a fruitful conversational context was created. Such a context entails two distinctive features. First, a safe and relaxed environment in which participants would feel at ease and open to freely express their thoughts and beliefs. If personal values were to be shared, a focus group environment had to be trustworthy and non-threatening (see also (Greenbaum 2000)). Second, the participants and their group facilitator should not waste too much time and energy on participants disagreeing with each other. This is what would happen in group discussions in which conflicting values and ideals are present. They have a tendency to

become superficial because of the wasted time and energy. For this reason we decided to work with groups of congenial minds.

These process-conditions were met by the implementation of two guiding principles. First, we strived for homogeneity *within* the groups and heterogeneity *between* the groups. In this study, homogeneity meant that the participants joining in a particular focus group meeting more or less shared the same attitude towards nature, ranging from antropocentric to ecocentric viewpoints. The second principle entailed working with structured exercises during the focus group sessions. There is always a balance between structure and freedom. Although a free floating discussion certainly helps in the creative construction of ideas, sometimes a directive structure is needed to allow in-depth examination of what has come forward or to prevent dominant participants to claim superiority over other participants. For example write-down exercises are very suitable to let every participant have its say.


Then, there is the vital role of the group facilitator. In accordance with the grounded theory approach, the facilitator had to ensure that the conversation unfolded in a spontaneous fashion as to minimize the effect of his/ her own role or the structure of the interview. Also in the realization of a safe and relaxed environment in which participants can easily share their thoughts and beliefs, the facilitator played an important part. During the session, the facilitator was to maintain a continuous balance between structure and freedom, by both presenting him or herself as the authority on the process and being an active listener to what participants have to say at the same time (see also (Greenbaum 2000)). To accomplish this, facilitators in this study used critically formulated group assignments and restricted themselves to process statements, i.e, go-rounds and 'why' questions to make concepts explicit. Furthermore, the facilitator would encourage interaction between members of the group.

5. Selecting and grouping the participants

Our study explicitly concerned qualitative variation, not quantitative representation of the ideas about animals in Dutch society. The selection of participants for the focus group sessions should therefore encompass the diversity of ideas. As was mentioned, we aimed for homogeneity within the groups and heterogeneity between the groups to facilitate open and in-depth exploration of ideas. To achieve these aims, we have made use of a particular categorization which has been developed in a distinct societal debate, on how to deal with nature. This model, well-known in environmental philosophy, describes a range of viewpoints towards nature and the human-nature relationship, ranging from an antropocentric to an ecocentric view (Achterhuis 1995; Zweers 1995). This initial grouping was merely used as a search strategy to assemble groups of congenial minds in which participants would feel safe and social dynamics would optimize an open reflection on personal values. The collected focus group material was afterwards used to describe the actual attitudes towards animals.

The next step in the formation of the focus groups was a further selection based on profession, membership of social organizations and lifestyle. Also, we expanded our research population to groups of a specific religion or philosophy of life, because these are social groups that normally consider themselves unheard in the public debate about technology issues. For the entire range of viewpoints we formed 10 focus groups (Table 1). Additionally, we formed 5 mixed groups. These groups were cross sections of society not related to viewpoints towards nature.

Table 1. Selection and grouping of focus group participants for a range of viewpoints towards nature, from antropocentric to ecocentric views.

Antropocentric	Group	Thematic grouping parameters
	fg1	industrial farming
	fg2	laboratory-animal research
	fg3	pet breeding & retail/ fishing sports/ animal zoo workers
	fg4	farming/ countryside/ hunting/ foresting/ veterinary medicine
	fg5	catholic and protestant christianity
	fg6	islam
	fg7	organic farming/ nature conservation/ nature protection/ nature recreation/ vegetarianism/ humanism
	fg8	pet owners/ assistance animals/ animal sanctuary/ animal protection
	fg9	buddhist/ hindu/ bahá'í religions
	fg10	biodynamic farming/ veganism, deep ecology, antroposophy, nature religion
Ecocentric	mg1-5	random cross-sections of society

The 15 focus groups and mixed groups were organized between 26 january 2004 and 8 april 2004. The workshops were held in different regions of the Netherlands, geographically spread across the country. The groups ranged in size from 5 to 11 participants but contained a total number of 109 participants. The average age of the participants was 42 years. Although the over all participation of men and women was balanced, this was not the case for every single group. However, quantitative demographic representativeness was not an aim of this study. Rather we aimed at the qualitative exploration of ideas and interpretations.

6. The focus group workshop design

The focusgroup design was standardized for all groups and semi-structured. Each group discussion was 2-3 hours in duration. Sessions were recorded on video and audio tape for further analysis. All participants consented to these recordings on conditions of anonymity and restricted use of the recordings just for the purpose of this study. Each group discussion was guided by a facilitator. The facilitator was accompanied by a monitor, who observed the group dynamics and, roughly, form and content of the discussion. Also, the monitor assisted the facilitator in carrying out the assignments.

The overall structure of the program was designed to meet with the following criteria.

- The in-depth structure of animal perceptions is explored.
- The facilitator only plays a technical role
- A relaxed and trustworthy environment is created in which participants can easily share their thoughts and beliefs.
- The meaning of value concepts emerges in the process of social interaction.
- Value frameworks are constructed using the group's own language and concepts.

6.1 Focus group sessions

The collective activity of the focus group consisted of a step-by-step circling in on the variety and richness of ideas. The focus group program therefore moved from intuitions to conceptualized values through the repetitive use of structuring exercises (see figure 1).

A session started out with sharing and collecting the participants' direct intuitions and associations about animals. The next step was to articulate the stories behind the associations. The facilitator therefore repeatedly asked 'why-questions' in order to move from intuitions towards value concepts and the articulation of contextual stories. The next step was to systematize the value concepts by clustering them in value categories and ranking them in order of importance. Then, the group focused on a specific category and the process of association, articulation and systematization recommenced. Working this program, the participants constructed an interrelated network of concepts, beliefs and ideals they particularly valued about animals. The facilitator and monitor continually visualized the outcomes of discussions and exercises on flip-over sheets to make sure the group was able to continue working on the material that had come up in their interaction.

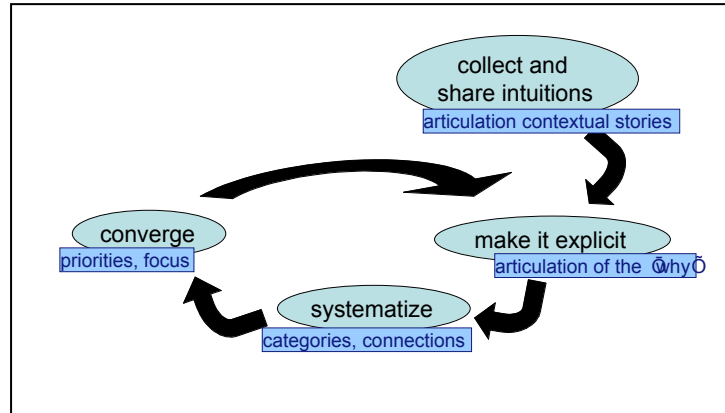


Fig 1. The focus group structure visualized.

6.2 Mixed group sessions

As was mentioned above three of the mixed groups worked the same program as the focus groups did. For the other two mixed groups a different setup was chosen. In the standard program, discussed above, the participants started at the level of intuitive association and slowly moved towards making moral intuitions explicit in a group-specific conceptualization of the intrinsic value of animals. The two remaining mixed groups started directly with an introduction of the intrinsic value concept and its role in the public debate. Subsequently, these groups completed the same exercises but now from the perspective of the intrinsic value concept. We wanted to find out what meaning the participants would attribute to this concept and whether they would use it at all if they were to give their ideas and opinions about animals.

7. The reconstruction of value frameworks

This study's aim was to explore the various value frameworks that are used in the reflection on animals in the Netherlands. Organizing 15 focus groups and mixed groups provided us with several group stories about values of animals that matter in their particular perspective. Altogether, these stories encompassed the variety and richness of ideas about animals in the Netherlands. The next step in the research process was to reconstruct the value frameworks in which the group stories were grounded. Reconstruction followed two interdependent tracks. First of all, during the focus group sessions, the participants themselves – together with the facilitators- worked on the articulation and structuring of their own beliefs and ideas. The second track of reconstructing value frameworks was performed by the researchers, after having facilitated all of the focus group sessions. Analysis of the

participant stories was guided by the grounded theory approach (Glaser and Strauss 1967). In this study the analysis of focus group stories was an iterative process in a continuous exchange between raw data and the analytical and theoretical ideas researchers developed during the study.

We reconstructed value frameworks using a basic qualitative coding method (Strauss and Corbin 1998); (Baarda 2005)). Textual transcripts were read and re-read to identify and index themes and categories. In this first ordering phase raw transcripts were separated into relevant fragments. To each of the relevant fragments a label was assigned, referring to the distinctive feature of that fragment. A distinctive feature signifies what a particular fragment is about. In our study the distinctive feature of a fragment corresponded to the *value concept* underlying that fragment.

The next step in the coding process was to sort out these value concepts into *value categories*. During the process of coding some concepts appeared to be closer together than others, sharing some kind of common feature that interconnected them. This common feature was labelled as the value category. Value categories linked the initially assigned value concepts. In fact, these concepts figure as separate dimensions of the value categories. They are understood as specifications of the common feature the value categories refer to.

Eventually, the categorization of values consisted of three levels of interpretation: value categories, concepts and descriptions.¹ The *value descriptions* can best be regarded as the colouring of the value concepts with literal details. Value descriptions correspond to the explanation that was given by

the participants to convey why they felt a particular animal value was important. Throughout the coding process, descriptions were phrased in the participants' own language. It was crucial to preserve this language because our investigation specifically aimed at understanding the language and concepts citizens themselves use to express their thoughts. By using this labelling system in the process of qualitative coding, we managed to interpret the participants' stories without losing sight of their own language (terminology and vocabulary), concepts and priorities. Figure 2 shows an example of the eventual categorization.

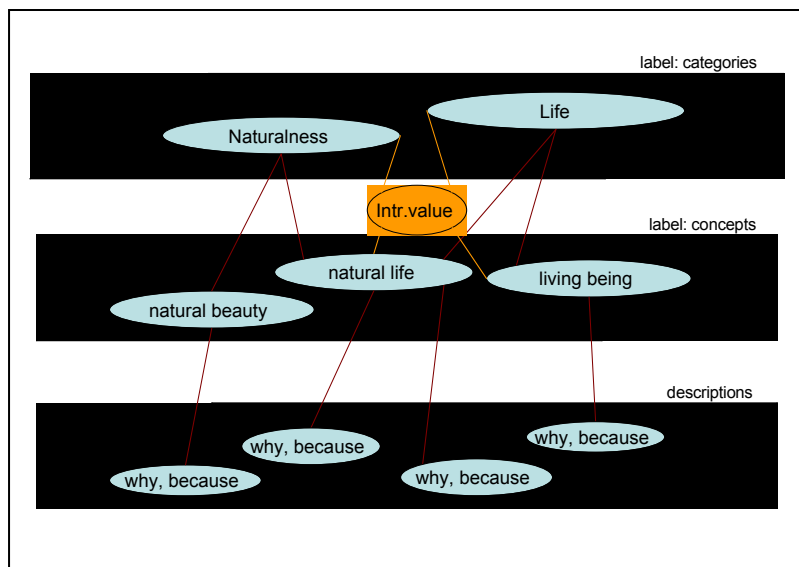


Fig. 2 systematic coding leads to three levels of interpretation: value categories, value concepts and value descriptions

¹ Baarda et al. (2005) use the same three levels of interpretation, only referring to them as the labels, dimensions and loads of text fragments.

As is shown in figure 2, the systematic coding procedures produce relationships between various value concepts and categories. Through this process of categorization and linkage a complex network of interconnected value concepts was reconstructed. This activity of coding, categorizing and linkage clarified which value concepts were used in the discourse of a specific group. Our next step was to investigate the relative weight of these value concepts. During the sessions the participants explored this weight by making a priority ranking of all gathered value concepts. In the text analysis the frequency by which a particular concept was expressed throughout the focus group session was taken as a measure for the relative weight of value concepts. By using these two different approaches – the priority ranking by participants during the sessions and the subsequent frequency analysis – we were able to form a more accurate interpretation of the relative weight of value concepts in the group discourses. Both the analysed concept frequencies and the priority rankings by the participants themselves gave a similar picture about what value concepts were thought of as important in these groups.

One of the advantages of analysing the focus group stories by this coding method was that it distinguishes differences and similarities between the groups. Comparing the concept maps and concept frequencies of all 10 focus groups showed to what extent groups exhibited a mutual coherence. Certain groups appeared to refer to similar value concepts when they expressed what they thought was valuable about animals. Also the relative weight they assigned to value concepts was comparable for those groups. Of course, each of the focus groups went through an unique process of interaction. So also in the groups that exhibit mutual coherence there are differences in how value concepts are framed and how often they are expressed. However, after reading and re-reading, we were able to distinguish different interpretative patterns. This iterative cycle of interpretation was gone through by 4 separate interpreters. Two of them were the researchers that had also accomplished the coding and categorization whereas the other two were projectleaders, not involved in the practical work of data collection and analysis. The interpreters independently reconstructed 4 distinctive discourses, each of them grounded in a specific value framework.

Having characterized the central concepts for each of the value frameworks, we moved back to the words and language the participants actually used in the focus group sessions. We reconstructed the narratives that conveyed how the animal was seen and valued. Figure 3 visualizes the global direction of the research process. We started out with stories told by participants in focus group sessions. In two interdependent tracks the value frameworks were reconstructed in which these stories are grounded. The value frameworks were used to reconstruct the narratives in which the animal and the human-animal relationship are positioned. Both the value frameworks and the narratives were regarded as the main products of this exploration.

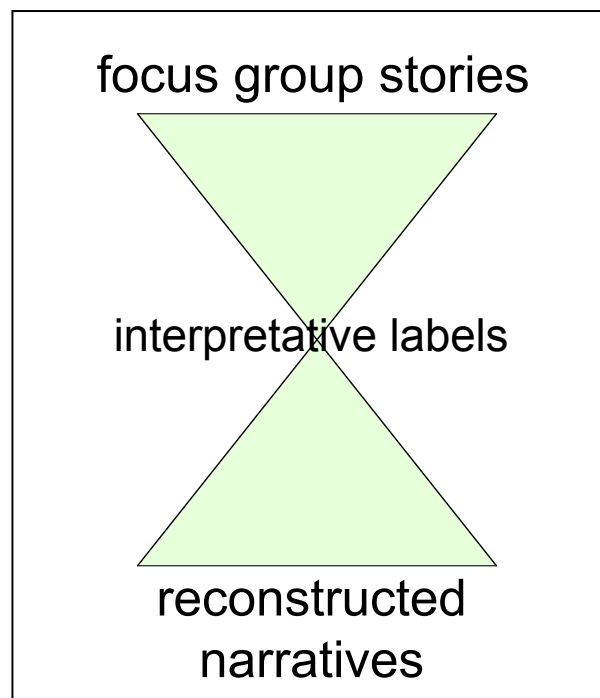


Fig. 3 Global direction of the research process

7. 1 Four discourses on the value of animals

The discourse narratives have a descriptive sense (a vision of what an animal is) and a normative sense (a vision of why animals are important and how people should treat animals). They are built up from 6 major themes that we identified during analysis of the focus group data.

- On how the animal itself is seen
- On the place of the animal in this world
- On the relation between humans and animals
- On the use of animals
- On how animals should be able to live
- On the moral responsibilities of humans concerning animals

An in-depth discussion of the four discourses and their consequences for constituting concepts in normative theory will be discussed elsewhere (Kupper forthcoming). The methodological character of this article does not allow for an extensive discussion of the frameworks and related discourse narratives, but we will give a short description (Table 2).

Discourse	The animal as:
USE	a functional element in food consumption and an instrumental source of knowledge to increase human understanding of the world. Humans may use the animal for their own benefit, be it in a responsible way, paying attention to health and well-being of the animal.
RELATION	an individual character that is primarily functional in the relation between humans and animals. The two do live together, although the hierarchy is set. Humans benefit, while the animal remains unaffected or benefit itself.
BALANCE	an individual living being in the same system as humans are part of. The diversity of this system is important. As opposed to the current situation, human should take a more modest position and permit animals some more space to live its own life in its own way, although should be reasonably possible.
SOURCE	a distinctive being, vitally interconnected with all existing things. Humans should at least treat animals in an equal and respectful way, whatever the circumstances. The role of humans is not deciding, at most participating, in the progression of the whole.

Table 2. Four discourses of animal value. Each named after the central value concept in its framework.

8. Discussion

The application of our interactive focus group method led to the articulation of four in-depth structured value frameworks underlying the reflection on animals in the Netherlands. In this section we discuss the workings of this method and the implications of the articulated frameworks for the public debate about animal biotechnology.

8.1 A conversational context

For an in-depth exploration of the values participants themselves attribute to animals, it was crucial to create a fruitful conversational context. The focus group environment had to be safe and relaxed as to enable participants to feel at ease and freely express their thoughts and beliefs. We established two guiding principles to make this conversational context work. First, we strived for homogeneity within the focus groups. Second, we designed structured exercises to elicit productive reflection and deliberation. The effect of establishing these two

guiding principles can be evaluated on both process and content. What was the effect of homogeneity on the content of the group sessions? We observed that in the *homogeneous* focus groups a clear image of value orientation was constructed whereas the *heterogeneous* mixed groups lacked this clear image. In homogeneous groups more of the values expressed were shared or taken up by other participants. Homogeneity also had a considerable effect on the group interaction process. On the whole, the focus groups showed group adhesion and a strong sense of solidarity. Participants mentioned that it felt good to discuss these matters among people with similar minds. Mixed groups showed less of this sense of solidarity although the discussion group setting in itself also in these groups constituted a friendly atmosphere, although more time was spent to 'convincing' instead of 'clarifying' which had a negative impact on the time schedule. With respect to the use of structured exercises, we also observed considerable effects on process and content. Regarding process, a participant mentioned that she liked the idea that everybody's opinion got equal attention. In our experience, the use of structured exercises suppressed dominance and created enough space for expressing a diversity of ideas. Regarding content, we feel that the structured exercises allowed real in-depth exploration. In the words of one of the participants: "some of the values are located really deep inside.. I just don't use them everyday.. this approach worked for me as a way to make things concrete."

8.2 The selection and grouping of participants

Selection and grouping had two aims. First, to establish homogeneity within the groups and heterogeneity between the groups. Second, to encompass the qualitative diversity of ideas about animals in the Netherlands. With respect to the homogeneity, in two of the focus groups there was a small part of 2-3 participants on a total of 11 that were misplaced. Both groups were analysed as belonging to the *Relation* discourse whereas the minorities' discourses appeared to be much closer to the *Balance* discourse. They constituted a value pattern that was typical for their thinking but was not shared or taken up later by the other participants. Therefore, the misplacement did not interfere with the reconstruction of a value framework based on the focus group data of these two groups. On the level of process, the minority participants did let us know that they themselves also felt misplaced. Also the Christian and Islamic groups appeared not to be homogeneous with respect to their ideas about animals, despite the fact that they shared their religion. Apparently, religion was not the strongest determinant of animal values in these groups. On the level of process, there were no observations that this disturbed group interaction. With respect to the question whether we have encompassed the diversity of ideas, we have observed that at least the mixed groups, which were cross-sections of society, do not show additional value patterns. Of course, using a selection strategy necessarily entails that we miss out on some social groups, for example the people that hate animals or are generally indifferent to animals or to this project. This is only a problem insofar as that these groups would provide new or unmentioned ideas about animals. Based on the richness of our focus group data we believe that this is not the case. Furthermore, if people do not participate because they are indifferent to what happens in this project, this probably means that they do not participate in the democratic process at all. This means that missing out on these groups does not harm our study's aim to facilitate a democratic deliberation process about animal biotechnology.

8.3 Implications for policy-making

The different value frameworks reconstructed in this study should be thought of as idealtypes. Although for everyone a specific pattern is predominant, other contexts may invoke the use of language and concepts that belong to one of the other patterns of thinking. Also the concept of intrinsic value of animals acquires a different place and function in each of the moral frames of reference. The Dutch legislation defined the concept of

intrinsic value as the health, well-being and integrity of the animal. None of the patterns we have found match this definition exactly, although all of the patterns do recognize the concept of intrinsic value in their own way. These observations bear implications for the policy-making on animal biotechnology. First, the concept of intrinsic value, starting point of Dutch governmental policy, is understood differently by government and diverse groups of citizens. Second, the results of this study explain the nature of social conflicts in the context of the human-animal relationship. Using the here described interactive research method we have delineated four different value frameworks that convey a typical way in which animals are positioned and valued. Knowledge of the differences between these value frameworks and the legal framing of the biotechnology debate provides constructive options to reopen dialogue (and to avoid frustrating dead ends) in the moral deliberation on animal biotechnology.

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