Euthanasia: a valuable skill or a necessary evil?

Designing and pre-testing a questionnaire to gain insight into the euthanasia decision-making process of veterinarians.

MASTER'S THESIS

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Abstract

Euthanasia of animals can be a stressful component of the veterinary practice, since the decision to euthanise an animal is often complicated by several factors or considerations. In this literature study, a questionnaire was designed which can be used to gain insight into the decision-making process of veterinarians regarding complex euthanasia cases. The aim of the questionnaire is to find out which considerations and to what extent influence this decision-making process. The basis of the questionnaire was formed by eight considerations found in literature, which were supplemented by three more factors that were found during the design of the questionnaire. To decrease the chance of social desirability bias, the considerations are implemented into brief, hypothetical case scenarios, also called vignettes. These vignettes address case scenarios about equines, companion animals and farm animals and are (partly) based on previous literature. Veterinarians are asked to what extent they agree with euthanasia in the given case scenarios. Within the case scenarios, the various considerations are varied to find out the relative importance of these considerations. Since not all considerations could be included in the vignettes, the questionnaire also contains statements and questions in which the considerations are implemented. These statements and questions are based on literature of the humane and veterinary medical field and as a result of this the questionnaire has been divided into four themes: personal experiences, opinions, case scenarios and demographics. To increase the reliability and validity of the questionnaire, a pre-test was conducted among 15 veterinarians and non-veterinarians. Comments and suggestions were summarized and evaluated, and incorporated into a revised version of the questionnaire. Although there are still some minor adjustments to be made, the result of this study is a well-founded questionnaire that can be distributed among Dutch veterinarians.

Contents

1. Introduction

Euthanasia is a common and central component of veterinary practice. Some veterinarians experience it as a valuable skill to help put animals out of their misery or to give them a dignified ending. However, euthanasia can also be experienced as a burden. Because even though veterinarians are trained to exam the health and welfare of animals and to perform euthanasia, the decision-making process of if and when to euthanise appears to be complex. This is due to the fact that the decision to euthanise an animal is complicated by contextual factors as time, clinical limitations, financial concerns, legal issues and grief (1). Relational factors like the emotional bond between animal owners and their animals, the relationship between veterinarians and pet owners, and between veterinarians and their colleagues also play a role (1). Several studies (2–8) have focused on the role of these aspects regarding euthanasia. Though none of them provide a complete description of what considerations are made by veterinarians in the decision-making process regarding euthanasia and to what extent they influence the decision.

It has been established that euthanising animals is considered to be stressful for veterinarians (9,10) and might even contribute to higher suicide rates, which are higher among veterinarians in comparison to other healthcare professionals (11). Hence, the described complexity of euthanasia decisions is a concerning issue that needs further attention in the veterinary profession. Scientific research on how veterinarians could deal with related dilemmas might contribute to the wellbeing of veterinarians. At present, limited research is available about this subject and veterinarians have few tools which they can use in case of a difficult euthanasia decision. In contrast, in human medicine a lot of research has been conducted on euthanasia, giving doctors much more guidance during the euthanasia process (12–19). Moreover, in countries where euthanasia on humans is legal, like Belgium and the Netherlands, the decision-making process of euthanasia is strictly regulated by law (18,19). Euthanasia of animals is also regulated by law and guidelines, like the AVMA Guidelines for the Euthanasia of Animals (20). However, both the law and the guidelines focus mainly on how to perform euthanasia itself appropriately, and only little attention is given to the decision-making process leading to euthanasia. We think that it is important to devote more attention to the current lack of guidance for veterinarians during the euthanasia process.

The goal of this research is to gain insight into the decision-making process of veterinarians regarding complex euthanasia cases, by finding out which considerations and to what extent, influence the decision-making process around these complex euthanasia cases. In this study, a questionnaire including case vignettes was designed. Therefore, validated questionnaires were used and new vignettes were designed when needed. The questionnaire was pre-tested and based on the result of this pre-test, adjustments were made. In a future study, the questionnaire will be distributed among Dutch veterinarians. The obtained results will hopefully provide a better understanding of the decision-making process regarding euthanasia, which may contribute to developing tools to help veterinarians when they encounter complex euthanasia decision-making.

2. Background

2.1 Previous research

In a previous master's thesis (21) a literature study was conducted to establish which criteria a questionnaire should meet in order to find which considerations influence the decision-making process of veterinarians regarding complex euthanasia cases and to what extent. Several research methods were reviewed and it was concluded that an adaptive conjoint analysis and the use of case scenarios seemed most suitable for this research goal (21). These research methods will be explained in *chapter 2.2.* Furthermore, six studies (2–7) were found in literature about the decision-making process of veterinarians regarding euthanasia cases. Out of these studies, eight considerations that influence the decision-making process could be found, which were categorized in: animal-, veterinarian-, and owner-related considerations (21). These considerations can be found in *Table 1*.

Table 1: Considerations that influence the decision-making process of veterinarians to apply euthanasia (21).

Category	Consideration
Animal	Animal Health Animal welfare Age
Owner	Owner requests treatment or euthanasia Financial situation Bond between animal and owner
Veterinarian	Prognosis Quality of life

The six previously mentioned studies (2–7) were also used to design case scenarios to help weigh the different considerations. Case scenarios that showed dividing opinions among veterinarians were classified as complex cases (21). Especially these cases, where veterinarians seem to struggle to give a "right" answer are useful to establish which considerations are made during the complex decision-making process. Besides, using case scenarios from validated studies helps increase the validity of the questionnaire. For equines and companion animals, several cases which can be classified as complex were found in literature. However, no complex case scenarios about farm animals have been found in previous studies. As a result, it was decided that case scenarios from interviews by Ellen Deelen can be used or new case scenarios can be designed based on the complex case scenarios about equines and companion animals (21).

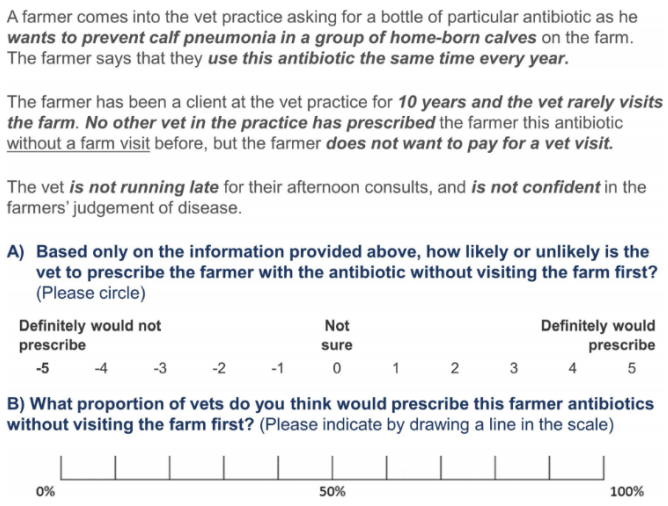
2.2 Conjoint analysis and vignette-based research

As mentioned earlier, in a previous master's thesis on the same subject as this study, it was concluded that an adaptive conjoint analysis seemed most suitable to answer the research question (21). Conjoint analysis is a frequently used marketing research method that is used to identify the relative importance of different characteristics of a product. By forcing customers to make trade-offs among different attributes of a product or service, the choice processes of customers can be studied (22,23). First, a set of attributes and corresponding attribute levels have to be designed. In this study, these are the categories and considerations described in *Table 1*. These attributes and levels will then be presented to the respondent in the form of scenarios, which consist of several subsets of possible combinations. By asking which subset they prefer, the influence of each attribute on the decision-making process can be evaluated, as well as which level within each attribute is preferred (22,23). In an adaptive conjoint analysis, extra questions are asked to determine the preference order of the different levels within an attribute, in order to obtain extra information about the importance of each attribute. This type of analysis consists of four steps, starting with respondents ranking their preference for each level of each attribute. After selecting the best and worst levels, in step two respondents are asked to indicate how important the difference is between these levels. In step three, several attributes are showed simultaneously, and respondents have to make a "trade-off" between the different profiles. In this

stage, the computer adapts the questions based on the earlier entered responses. Finally, in step four, different profiles are shown and a score from 0 to 100 must be given to evaluate how much these combinations of attributes have influenced the decision-making (23).
This method has been used in several veterinary-related studies to gain more insight into the decision-making process of veterinarians (24–30). However, these studies addressed less sensitive subjects than euthanasia, and are mainly focused on determining preferences for or perspectives on certain disease management- or health programs. An adaptive conjoint analysis is an explicit way of asking the opinion of respondents about certain issues. It becomes very clear for the respondent which attributes and levels are being researched. If this method is used to research a more sensitive subject, like euthanasia, we suspect there might be a higher chance of social desirability bias. This can lead to unreliable results, as respondents might conceal their true opinion to obtain social approval or to maintain a positive self-perception (31). It is also possible that respondents might feel uncomfortable with the subject, which may lead to them not wanting to (continue) filling in the questionnaire. To avoid this and to avoid social desirability bias, a more indirect way to assess sensitive issues is preferred.
Vignette-based surveys are a widely used method to measure decision criteria in the social sciences and are often considered to be less prone to social desirability bias than conventional studies (31,32). Similar to the conjoint analysis, attributes (also called dimensions) with corresponding attribute levels are used, only these are now incorporated in vignettes. A vignette is a brief hypothetical description of an object, person or situation (32,33). By varying multiple dimensions in different vignettes and asking respondents to evaluate these vignettes as a whole, they are forced to make trade-offs between the single dimensions. Then it can be estimated how the different dimensions influence the respondents' judgement and conclusions can be drawn on the relative importance and the interactions of the single dimensions (31–33).

2.3 Variables and "the vignette universe"

The basis of vignette studies is formed by the attributes of the vignettes, these are also called factors or dimensions, and each dimension can consist of multiple levels or values (32,33). By combining all dimensions and levels, a population of all possible vignettes is created, which is also called the vignette universe (34). The dimensions and associated levels of the vignettes are the independent variables, which means only the effects of those factors that are included in the vignettes can be found (33,34). The crucial part of a vignette study is the dependent variable because this concerns the actual behaviour of the respondents. This is the variable that investigates the actual effects of the vignette dimensions on the respondents' judgements (33,34). To investigate the behaviour of the respondents, they can be offered a concrete choice ('what would you do?') or they can be asked to give an estimation ('to what extent do you agree/disagree?') (33).
In *Figure 1* an example vignette is demonstrated that was used in a factorial survey about veterinarians' decision making when prescribing antimicrobials to sheep and beef farmers in the UK (35). The variables and levels that were used to create the vignette universe of this study are demonstrated in *Figure 2*.


A farmer comes into the vet practice asking for a bottle of particular antibiotic as he ***wants to prevent calf pneumonia in a group of home-born calves*** on the farm. The farmer says that they ***use this antibiotic the same time every year.***

The farmer has been a client at the vet practice for ***10 years and the vet rarely visits the farm. No other vet in the practice has prescribed*** the farmer this antibiotic without a farm visit before, but the farmer ***does not want to pay for a vet visit.***

The vet ***is not running late*** for their afternoon consults, and ***is not confident*** in the farmers' judgement of disease.

A) Based only on the information provided above, how likely or unlikely is the vet to prescribe the farmer with the antibiotic without visiting the farm first? (Please circle)

Definitely would not prescribe					Not sure					Definitely would prescribe
-5	-4	-3	-2	-1	0	1	2	3	4	5

B) What proportion of vets do you think would prescribe this farmer antibiotics without visiting the farm first? (Please indicate by drawing a line in the scale)

0% 50% 100%

Figure 1: Example vignette of the study of Doidge et al. (35) on veterinarian's prescription behaviour of antimicrobials. The dimension-levels are shown in bold. The dependent variable (prescription behaviour) is here investigated by asking how likely or unlikely the vet is to prescribe antibiotics in the given scenario.

Variable	Level
Knowledge of case	1. Farmer suspects case of calf pneumonia. 2. Farmer suspects case of watery mouth. 3. Farmer wants to prevent watery mouth. 4. Farmer wants to prevent calf pneumonia.
Farmer relationship influence	1. The farmer is a long term client and the veterinarian regularly visits his dairy herd but not as involved with the sheep or beef cattle. 2. The farmer is a long term client and the veterinarian rarely visits the farm. 3. The farmer is a new client.
Veterinarian influence	1. Other veterinarians in the practice have given the farmer this antibiotic before without consultation. 2. No other veterinarian in the practice has given the farmer this antibiotic before without consultation.
Time pressure	1. No time pressure for prescription. 2. Running late for afternoon surgery consults.
Habit	1. The farmer comes in for the same medication the same time every year. 2. The farmer has never used the antibiotic for this reason before.
Willingness to pay	1. Farmer does not want to pay for a veterinary visit. 2. Farmer says he is happy for a veterinary visit.
Confidence	1. The veterinarian is confident in the farmers' judgement of the disease. 2. The veterinarian is not confident in the farmers' judgement of disease.

Figure 2: Variables (dimensions) and levels (values) included in the factorial survey vignettes of the study of Doidge et al. (35).

2.4 Advantages of vignette-based research

As already stated above, when researching sensitive subjects the use of vignettes can reduce social desirability bias (31,32,36). Because of the multidimensionality of a vignette, the respondents are required to undertake a rather complex task by evaluating multiple factors simultaneously. This draws the attention away from evaluating the sensitivity of every single dimension, making it less likely that the respondent will feel uncomfortable while answering the questions (31,36). The multidimensional nature of this method also makes it possible to investigate the influence of a large number of factors on the judgement of a person or situation. In unidimensional question formats, it is often not possible to determine which assumptions the respondent's answer is based on (31). However, by varying the different dimensions throughout the vignettes, the researcher can create a 'laboratory-like situation' with as few confounding factors as possible, in which it is possible to gain insight into the way the respondent reached an answer (33). In this way, complex situations like the decision-making process around euthanasia can be reduced to a clear situation. This is necessary to determine the importance and influence of the different factors, however, it also provides contextual information for the respondent in order to give reliable answers (31,33).

Another important advantage of the vignette-method is that relatively few respondents are needed to investigate a large number of factors. Because the different possible combinations of factors are randomly distributed among respondents, this results in an optimal variation in the relevant factors and (almost) no correlation between the various factors. There is no 'sample selection bias', making it possible to determine the individual effects in a statistically reliable way (33). Finally, the vignette-method has relatively low requirements in terms of time, personnel, and financial resources, which makes it an efficient research method (36).

2.5 Disadvantages of vignette-based research

A key consideration, that has to be taken into account in all vignette studies, is that the hypothetical behaviour of a respondent may differ from his actual behaviour in a real-life situation. As the respondents are asked to make choices based on a written hypothetical situation, they may tend to judge situations more rationally than they would in the "real world" (33,36). This may cause some concerns about the external validity. In most vignette studies the correspondence between hypothetical behaviour and actual behaviour is not measured, due to ethical or logistical reasons. However, there is some evidence available that suggests that respondents respond in a similar matter to hypothetical and real-life situations (36,37). In the study of Evans et al. (36) several studies and reviews have been addressed, demonstrating that there is little difference between observations in vignette studies and

actual real-life behaviour. Sometimes the vignettes may lead to larger effect sizes, reflecting some reduction in external validity but also some increase in internal validity (36).
Another possible disadvantage of the vignette-research method is that if a small sample size is used, the effects of the respondent's personal characteristics can not be determined (33). Although these characteristics indeed can play a role when assessing a situation. To determine the effect of personal characteristics (like gender and age), a bigger sample size is necessary. If this is not possible, it must be assured that during the selection process of the respondents there is a spread in relevant personal characteristics in the study population (33).

2.6 Types of vignette-based research
There are some variations of the vignette-research method, the following variations will be discussed below: the within-subject design, the between-subject design and a mixed-design. In addition, the difference between an experimental vignette design and a factorial design will be discussed.

2.6.1 Within-subject design
In a within-subject design, all participants are presented with a set of vignettes and each participant views the same set (31,36,38). This means that the dimensions of interest vary from scenario to scenario and the respondent has to review multiple vignettes. In this way, the effects of a certain manipulation within one individual can be uncovered, which is useful if the researcher wants to investigate the judgement process of single individuals (31,38). Although respondents need to answer more questions which may increase the dropout rate, much more data is obtained with fewer respondents than for example in a between-subject design (39,40). Furthermore, by giving respondents multiple vignettes, contextual information is provided and they can use the other vignettes as reference points for their own judgements(38). However, this can also be a disadvantage, as varying the sensitive dimension may draw the attention of the respondent to this dimension, increasing the risk of social desirability bias (31,39). Moreover, there may be so-called 'carry-over effects' or 'range effects'. This means that the first question that is asked has an effect on all the other questions that are being asked afterwards and the order in which the questions are asked may affect the outcome. To avoid this kind of bias, the order of questions can be varied and randomized (39).
Overall, the within-subject design has a higher statistical power compared to the between-subject design (39,40).

2.6.2 Between-subject design
Another variation of the vignette-research method is the between-subject design. In this methodology, respondents are randomly assigned to different groups, within these groups each respondent is presented with the same vignette. In this way, comparisons can be made across the respondents and between groups (31,36,38). As the sensitive dimension is kept constant within one respondent's vignette, it is assumed that this attracts less attention and as a result, respondents are less likely to give socially desirable answers (31). Another advantage of this design is that it is less prone to the earlier mentioned "carry-over and range effects", as only one vignette is presented to the respondents and they are not being influenced by earlier questions or the order of these questions (39). However, the downside of this is the lack of contextual information. Without other vignettes as reference points, respondents may not give answers that reflect their true judgements (38). It is recommended to provide participants with sufficient background information before exposing them to the vignettes, to give them enough context to obtain reliable answers (31,38). Compared to the within-subject design, in the between-subject design the survey time is cut in half which may increase the response rate. Though, to get the same statistical power as the within-subject design, four to eight times more respondents are needed (40). Moreover, this type of design also comes with larger standard errors, which also reduces the statistical power (31,39,40).
To provide a better understanding of the differences between the within-subject design and the between-subject design, a simplified example of both designs is presented in *Table 2*.

Table 2: A simplified example of the within-subject design and the between-subject design used in vignette surveys. The case scenario is adopted from the KOPPEL-study for illustrative purposes (18). A vignette sample consists of a set combination of dimension-levels. In this example, in the within-subject design all six respondent are presented with the same three vignette samples. In the between-subject design, the respondents are divided into three groups, within each group the respondents view the same vignette sample.

Within-subject design		**Between-subject design**	
Respondent	Vignette sample	Respondent	Vignette sample
1	1 + 2 + 3	1	1
2	1 + 2 + 3	2	1
3	1 + 2 + 3	3	2
4	1 + 2 + 3	4	2
5	1 + 2 + 3	5	3
6	1 + 2 + 3	6	3

Vignette sample 1	**Vignette sample 2**	**Vignette sample 3**
Mr Avezaath is a 70-year-old man with incurable colon cancer. He is in severe pain. The doctor expects him to die within a week. The morphine he is receiving is not helping sufficiently against the pain. In consultation with Mr Avezaath, the doctor decides to put him into a deep sleep until his death, **so that he will no longer be in pain.** He is then unable to eat or drink on his own and is not given any fluids or nourishment. The doctor administers sedatives to Mr Avezaath, after which he soon falls into a deep sleep **and dies after a week.**	As in vignette 1, but now the doctor expects death **within a month.**	As in vignette 1, but now the doctor expects **death within a month** and puts the patient to sleep **so that he will die as soon as possible.**
	Question to the vignettes: Respondents were asked whether they thought that the actions of the doctor in the case in question were legally allowed in the Netherlands, whether they personally thought these actions were correct and what term they would use to describe these actions.	

2.6.3 Mixed-design

In a mixed-design, respondents are randomly assigned to different groups which receive different sets of vignettes. So within a group, the respondents see the same vignette set, but between the groups the vignette sets differ (36,38). Because the vignette sets are judged by multiple respondents, comparisons can be made across respondents but also across the different groups (38).

2.6.4 Experimental vignette designs vs factorial surveys

When using only a small number of dimensions and levels, the total vignette universe is small enough to be judged by each respondent. If this is the case, the design falls under the experimental vignette design (34,41). This type of design typically includes two to seven dimensions and a small number of dimension-levels, with each dimension preferably having the same number of levels (41). When the research involves large numbers of dimensions and levels and different numbers of dimension-levels, the vignette universe becomes too large to have every vignette judged by each respondent. In such case, it is necessary to draw vignette samples of the vignette universe, which are either random or experimentally planned assigned to each respondent (34,41). This is called a factorial survey design (34,36,41). In a factorial survey design, the experimental variables can be randomly varied directly within the vignette text for each respondent (36). By generating unique vignette variations out of a large number of possible variations, patterns of variation associated with the vignette characteristics can be analysed. So each respondent receives his own specific set, but some (parts of) vignettes are contained in several other sets (36,41). It is comparable to using a kind of mixed-design which, as the vignette population increases, converts to a between-subject design (41). In this way, a large part of the total vignette population can be assessed. This type of design can be useful in research questions

that involve large numbers of factors and continuous variables, although the complexity of the design may quickly increase and an experimental design may be more appropriate in some studies (36). Moreover, when using a factorial design there may be a severe loss of information due to an uncontrolled confounding of effects. These effects increase as the vignette universe grows larger, and the number of actually sampled vignettes decreases (41).

2.6.5 Most suitable design for this study

Based on the previously described advantages and disadvantages of the various designs, it was decided to use the within-subject design. This design has higher statistical power and requires far fewer respondents to get sufficient data than in the between-subject design. Initially, the use of a factorial design was also considered, but the variables used in our study turned out not to be suitable for this type of design. A further argumentation as to why we eventually decided to use the within-subject design can be found in the results section.

2.7 Current available questionnaires and vignettes in the humane and veterinary field

In the humane medical field, vignette-based research methodologies are frequently used to study medical-decision making processes (36,42). Several studies can be found that focus on euthanasia or end-of-life decisions, using vignettes to determine which factors or considerations are of importance during the decision-making process (13–18). In the area of veterinarian decision-making, there has been limited research. Only one recent study (35) can be found that specifically focuses on the influence of factors on the veterinarian's decision-making process, by researching the veterinarian's decision to prescribe antimicrobials to sheep and beef farmers without a clinical consultation. In this study (35), a factorial survey approach was used and respondents were presented with a series of eight vignettes, each consisting of seven factors with two to four possible levels (see *Figure 2*). In this way, the relative importance of several factors influencing the decision to prescribe antibiotics could be measured. It was suggested that the use of this kind of study approach reduces the confounding of social desirability bias, and this became evident from the results.

Six studies (2–7) can be found in literature, that focus on the motives of veterinarians to apply euthanasia. In three of these studies, a questionnaire supplemented by case scenarios was used to measure the attitudes of veterinarians towards euthanasia (2,3,5). After describing a case scenario, the veterinarians are asked to indicate to what extent they agree with euthanasia. Although this research method might seem similar to the use of case vignettes, there are no multiple dimensions and levels that can be varied between the cases, which makes it difficult to determine the relative importance of the single dimensions. As a result, a few things are already known about which considerations are of importance in the decision-making process to apply euthanasia, but a complete answer to the research question cannot be provided yet. To provide a more complete answer, instead of a questionnaire supplemented with case scenarios, we want to combine a questionnaire with case vignettes. As mentioned before, several studies have focussed on the motives of veterinarians to apply euthanasia and in five of these studies (2,3,5–7) a questionnaire was used, although none of these questionnaires can be qualified as validated.

In human medicine, a large-scale study about euthanasia has been conducted, the Knowledge and Opinions of the Public and Professionals regarding End of Life decisions study (KOPPEL study) (18). The goal of this study was to examine the knowledge and opinions of Dutch citizens and healthcare professionals about the laws and regulations on euthanasia, assisted suicide, palliative sedation, and advance euthanasia directives. This study also included case vignettes and a validated questionnaire, which was distributed among health care professionals to establish what practical experiences and problems they encounter with regard to medical end-of-life decisions and what the background is of these problems (18). The KOPPEL-study can be used as a valuable basis of our questionnaire design. Because, the questionnaire and vignettes in this study can be classified as validated and it addresses a similar subject as our research objective, parts of the questionnaire can be used to set up a questionnaire to answer our research question.

3. Methodology

3.1 Data collection

For designing the questionnaire and case vignettes, previous studies concerning euthanasia in the veterinary- and human medicine field were used. Out of several questionnaires of these studies, (parts of) the questions and case scenarios were used as the basis of our questionnaire design. This will be discussed in more detail in the results section. Furthermore, it was mentioned earlier that in a previous master's thesis (21) eight considerations were found that influence the decision-making process of veterinarians to apply euthanasia (*Table 1).* These considerations have also been incorporated into our questionnaire design, by selecting and designing questions and vignettes that include these considerations.

Scientific literature about vignette studies, attitudes towards euthanasia of animals and humans, and end-of-life decision-making in veterinary and human medicine was searched in Scopus, Google Scholar, PubMed and ProQuest. All used literature was selected based on relevance, publication date, number of citations and journal of publication.

3.2 Inclusion and exclusion criteria

This study aimed to design a questionnaire to gain insight into the decision-making process of veterinarians regarding complex euthanasia cases. The results of the questionnaire eventually will be used to achieve the ultimate research goal. Which brings us to the main research question: which considerations and to what extent, influence the decision-making process around these complex euthanasia cases? To answer this research question, several sub-questions have been formulated:

- *How often do veterinarians in the Netherlands have to deal with euthanasia cases?*
- *How often do they encounter difficulties in the decision-making process surrounding euthanasia?*
    - *What is considered a complex euthanasia case?*
    - *When do veterinarians choose to euthanise or not?*
    - *Which positive and negative experiences veterinarians have had with euthanasia?*
- *Do the considerations found in previous literature influence the decision-making process and if so, to what extent?*
- *Do demographic factors influence the decision-making process and if so, to what extent?*

While designing the questions and vignettes, consideration was given to whether they contributed to answering the above sub-questions. Questions of previous literature were included if they met this requirement or they were modified to do so. Since literature from human medicine was also used, questions were only included if they could be extrapolated to the veterinary field.

Case scenarios of previous research about equines and companion animals were included if they were classified as complex cases. These were the cases where there was a wide range in the answers of veterinarians, which may indicate that they struggled to give a 'right' answer to the question of whether to euthanise or not. Cases with unambiguous answers were excluded. As no complex case scenarios could be found in literature about farm animals, no literature-based case scenarios could be included and new cases were designed based on the complex scenarios about equines and companion animals.

3.3 Validity and reliability

To create a validated and reliable questionnaire design, the criteria for the questionnaire were based on literature. Relevant literature on how to set up a questionnaire was selected and summarised in a previous master's thesis on this subject (21). Choices with regard to general text guidelines, the use of open and closed questions, question-order, rating scales, sample size, and pre-testing were based on the literature (43–51) reviewed in the aforementioned master's thesis. To increase the validity of the questionnaire, a pre-test was conducted. The set-up of the pre-test is discussed below.

3.4 Pre-test

An important element of developing a questionnaire is to conduct a qualitative pre-test. The main purpose is to detect misunderstandings, ambiguities and other difficulties that may be encountered by participants. In this way, it can be verified that the questions and proposed response options are interpreted by the participants as the research intended (52). To achieve a reasonable power to detect relatively common prevalent problems, a sample size of 30 or more is preferred (52). Research about the response rate to mail surveys showed an average response of 30-40% (53). This means that to achieve the preferred sample size of 30, a group of at least 100 veterinarians should be invited for the pre-test. As this may already include a large part of our target audience, we considered this to be undesirable and decided to conduct the pre-test among a smaller group. To still increase the detectability of eventual problems, in-depth interviews can be used. In addition, it also is helpful to select self-aware persons who are well-capable to reflect on their thinking patterns (52).

A group of 15 people was selected, whom we considered meeting the above condition. The group consisted of 11 veterinarians and 4 non-veterinarians. Of which the non-veterinarians were people who are experienced in questionnaire research methods.

After designing the prototype version of the questionnaire, it was implemented in an online survey tool with Qualtrics software (54). Pre-test participants were asked to fill in the online questionnaire and their feedback on the questions was collected through a pre-test survey (*Appendix 1)*. The non-veterinarians were asked to comment on the clarity and overall set-up of the questionnaire. The veterinarians were also asked to comment on the content of the questions and the case scenarios. In addition, in-depth interviews were held with four of the participants to get a better idea of how they experienced filling in the questionnaire and what problems they encountered. Comments and suggestions were summarized and evaluated, and incorporated into a revised version.

4. Results

The result of this study is a questionnaire, consisting of closed questions, statements, case scenarios and demographic questions. Below we will describe the final design of the various parts of the questionnaire. The final version of the questionnaire can be found in *Appendix 2*.

4.1 Survey title and introduction

To attract the attention of veterinarians, the questionnaire is titled: “A valuable skill or a necessary evil?” Since this does not fully covers the purpose of the questionnaire, a subtitle was added: “Research on dilemmas regarding euthanasia”. Most pre-test respondents considered this to be a catchy title that covered the subject. Only two of the respondents mentioned in their feedback that the title might already guide the respondents in a certain direction, as within the title it is stated that a choice must be made if euthanasia is ‘good or bad’. In addition, they mentioned that the title might not completely reflect the goal of the research. It was decided that our aim of the title was to trigger people to show interest in the questionnaire, so we retained the original title. However, the subtitle was changed to: “Research on veterinarians' dilemmas regarding euthanasia of animals” to give a better idea of our research goal.

Prior to the start of the questionnaire, a short introduction is given. The goal of this research is explained and participants are asked for their informed consent. This is followed by a brief explanation of the terms euthanasia and animal-owner. This section was added in response to the pre-test feedback, since several participants asked what the term 'euthanasia' exactly means in this questionnaire. The definition we used is based on the AVMA guidelines and is as follows: “euthanasia is to end the life of an individual animal in a way that minimises or eliminates pain and suffering” (20). The definition of animal-owner was added to clarify that in the rest of the questionnaire the term "animal owner" is used, but that this includes pet owners, horse owners and livestock farmers.

4.2 Themes

Based on the sub-questions discussed in *Chapter 3.2*, it was decided to divide the questionnaire into themes. For the topics of the several themes, a validated questionnaire from the KOPPEL study was used (18). The KOPPEL study questionnaire addresses experiences and problems that healthcare professionals in human medicine encounter with regard to medical end-of-life decisions. Thus, this study is very closely related to our research question, only it is focused on human medicine. Therefore, we have made some targeted choices to deviate from the questions in order to better match the context of our research objective. The themes of the KOPPEL study questionnaire are: personal experiences, knowledge and opinions, and case scenarios. In all of these themes, a further subdivision is made into: euthanasia, assisted suicide, palliative sedation, and advance euthanasia directives. The questionnaire ends with demographic questions (18). Assisted suicide and advance euthanasia directives only occur in human medicine. Moreover, we are only interested in the considerations that are made during the decision-making process of euthanasia and not in decision-making on palliative sedation. So it was decided not to adopt the subdivisions. Furthermore, in the "knowledge" section of the KOPPEL study, health care professionals are specifically asked about their knowledge on euthanasia legalisation. In the introduction of this research, we already mentioned that the decision-making process of euthanasia on humans is strictly regulated by law (18,19). As this is not the case in veterinary medicine, the theme “knowledge and opinions” was changed to: “opinions”. This resulted in the following four themes: personal experiences, opinions, case scenarios and demographics. Each of these themes starts with a short introduction to explain to the respondents what they can expect within this part of the questionnaire.

4.3 Independent and dependent variables

In *Chapter 2.3* we explained that vignettes consist of dimensions and levels, which are the independent variables of the study. So before setting up the vignettes, the independent variables had to be determined. In this study, the independent variables are based on previous research about the decision-making process of veterinarians with regard to euthanasia. Eight considerations have been

found that influence the decision-making process (2–7). The independent variables that are based on these considerations can be found in *Table 3*.
The dependent variable measures the actual behaviour of the respondents, and therefore the effect of the independent variables on the respondent's judgement. As we want to investigate which considerations and to what extent influence the decision-making process, our dependent variable is the extent to which the respondent agrees with euthanasia in the given case.
In *Chapter 4.4.3* we will elaborate on how we incorporated these variables into the vignettes. As the independent variables were also used in the design of the questions and statements, this will be discussed in *Chapter 4.4.1*.

Table 3: Independent and dependent variables in our research.

Independent variables	**Dependent variable**
Animal Health	The extent to which the respondent agrees with euthanasia.
Animal welfare	
Age	
Owner requests treatment or euthanasia	
Financial situation	
Bond between animal and owner	
Prognosis	
Quality of life	

4.4 Set-up of the various questionnaire themes

The questions and statements of the themes "personal experiences" and "opinions" are based on questionnaires from three previous studies (3,7,18). These studies included questions that were considered to contribute to answering the sub-questions of our research. In order to fit our research goals, the questions were modified and complemented with our own insights and with the feedback of the pre-test respondents. In addition, the questionnaire was translated to Dutch, as we will distribute it among Dutch veterinarians in the future. Hereafter, we will discuss for each theme the design of the questions in more detail. A summary of the received feedback and the adjustments that were made per question number is displayed in *Table 4* and *Table 5*.

4.4.1 Personal experiences

Questions 1 and 2

After starting of with three demographic questions (which will be discussed further in *Chapter 4.4.4*) we chose to ask two general questions about how often veterinarians perform euthanasia and how often they have to deal with discussions about euthanasia. As there might be veterinarians who never perform euthanasia, the first question also involved an answer option "I never perform euthanasia, this is because...[please insert your answer]". In case this option is chosen, the questionnaire ends here, as further completion of the questionnaire is not applicable. The frequencies that were chosen for the other answer options were based on ranges that have been found in the study of Hartnack et al. (3). This study only focussed on small animal practice, which was reflected in the feedback from the pre-test respondents, as the farm animal veterinarians indicated that they thought the given frequencies were too low to be able to answer the question adequately. As a result, the frequencies have been adjusted to a more suitable range. Furthermore, almost all pre-test respondents indicated that they found the second question unclear and therefore had difficulty answering it properly. The original question was: "How often is euthanasia a discussion topic (with your customers)?". Based on the feedback, the question was reformulated into "How often do you have a conversation with an animal owner about whether or not to euthanise an animal?". This formulation is more neutral, since the word "discussion" may be perceived as something negative. Moreover, it is now clear for the respondent what is meant by "euthanasia as a discussion topic".

Questions 3 and 4

The questionnaire was continued with two questions about positive and negative experiences that veterinarians might have encountered during the decision-making process around euthanasia. These questions were adapted from the KOPPEL study (18) and for both questions all answer options were

evaluated to determine whether they could be extrapolated to the veterinary field. Then, each individual answer option was assessed to see if it could be linked to the predetermined independent variables of our study (see *Table 3)* or if it contributed to answering the sub-questions of our research. Response options that did not meet this conditions, were excluded. Although an exception was made for answer options that were related to the bond between veterinarians and their colleges. The research of Hartnack et al. (3) showed that the presence of colleges at work may also influence how veterinarians deal with euthanasia. As we suspected that this may also be a possible factor influencing the decision-making process, we decided to include these answer options.
Feedback obtained in the pre-test showed that respondents struggled with the formulation of the questions. This was due to the inconsistent use of "decision-making process" and "final decision" in the answer options. In addition, the wording of the questions itself seemed to be overly complex. Adjustments were made to make the questions more legible and the answer options more consistent. In question 4, respondents are asked to indicate how often they encounter the negative experiences that are mentioned in the answer options. One of the respondents pointed out that it is not clear to which period the question refers. As the goal is not to get an exact number on how often this occurs, but to get an overall impression on how often veterinarians encounter these experiences, we decided to leave this question as it is.

Question 5
After determining which positive and negative experiences may influence the decision process, we wanted to know to what extent certain reasons have caused veterinarians to refuse a euthanasia request in the past. For this question, the same approach was used as for questions 3 and 4. The question was based on a question from the KOPPEL study (18) and evaluated and modified to fit our research goals. Again, the various response options were linked to the predetermined variables and the sub-questions of our research to establish which answer options could be included.
As in the previous two questions, the pre-test showed that adjustments were necessary regarding the formulation of the answer options. In addition, several respondents indicated that they did not know what was meant by "deliberateness of a euthanasia request", and that they struggled to determine the difference between "unbearable" and "hopeless" suffering. In order to get reliable results, questions need to be unambiguous and be interpreted by respondents in the same way. As a result, the questions were reformulated and a definition of unbearable and hopeless suffering was given in the introduction of the theme (55).

Questions 6, 7 and 8
The questionnaire continues by asking if and how often in the past year, the veterinarian carried out euthanasia, even though he or she did not agree with it (*question 6).* If the respondents answer with "yes", they are asked why he or she did not agree with euthanasia and what reasons they had for eventually performing the euthanasia (*questions 7 and 8).* All three questions are based on previous research of Yeates and Main on veterinary opinions on refusing euthanasia (7). Several answer options are suggested and respondents are able to select multiple answers. As we also wanted to give respondents the option of indicating that they had a different reason than the suggested options, an answer option "different reason" was added. Initially, we did not give respondents the option to specify what this different reason was, because responses to open questions are difficult to analyse as they need to be grouped and coded to draw conclusions (43,44). However, the pre-test showed that respondents missed the option of being able to state their own reasons. Moreover, there is a possibility that by not giving respondents this option, important factors are being overlooked. This was actually already proven by the fact that in the pre-test equine- and farm animal veterinarians indicated that they missed an answer option in question 8: "The owner did not have space or financial means to keep an animal that was no longer fit for the purpose". This answer option was added to the question and in both questions 7 and 8 the option "different reason" was changed to an open answer option "I had another reason for doing this, namely…[please insert your answer]".

Question 9
As one of the predetermined variables is "animal health", we are also interested in if and how often veterinarians are requested to euthanise a healthy animal. This question was also included in the

questionnaire of Hartnack et al. (3) and the answer options that we set up are based on the results of that study. None of the pre-test respondents had comments on the frequencies used in the answer options. However, multiple respondents asked what was meant by a "healthy animal", which showed that this definition required further clarification. As a result, in the subtext of the question the definition of a healthy animal was explained as: "an animal that currently is in good physical condition, free from disease and that is in a state of positive welfare, by being able to actively adapt to its living conditions (56).

Questions 10, 11 and 12
The theme "personal experiences" ends with a question about how often in the past year the veterinarian experienced that it was decided not to euthanise an animal, although he or she thought this would be the best option (*question 10*). Just like in question 7 and 8, if the respondent's answer to question 10 is "yes", it is followed by two questions about why he or she thought euthanasia was the best option and what reasons they had for eventually not performing the euthanasia (*questions 11 and 12)*. These three questions and answer options were also based on the research of Yeates and Main (7). The pre-test respondents had the same comments on these questions with regard to missing the option of being able to state their own reasons why, so this possibility was added to the answer options. In addition, they indicated that both questions 11 and 12 contained answer options that seemed to address multiple issues within one option. This is undesirable, as this forces the respondent to agree or disagree with both issues, instead of having the choice to agree or disagree with only one of the addressed issues. As a result, the answer options were separated and reformulated to avoid ambiguous answers.

Table 4: Summary of received feedback and the adjustments that were made per question number. The final version of the questions can be found in Appendix 2.

Question number	**Received feedback in pre-test**	**Implemented adjustments in final questionnaire**
1	Frequencies of answer options to low.	Additional response options added.
2	Frequencies of answer options to low. Ambiguous question formulation.	Additional response options added. Reformulation of the question.
3	Inconsistent use of "decision-making process" and "final decision". Unnecessarily complicated wording.	Defined response options so that they all address the decision-making process. Reformulation of the question.
4	Inconsistent use of "decision-making process" and "final decision". Unnecessarily complicated wording. Unclear which period is meant when asking how often veterinarians encounter negative experiences.	Defined response options so that they all address the decision-making process. Reformulation of the question.
5	Ambiguous formulation of answer options. Definitions need further explanation.	Reformulation of answer options. Definitions of "unbearable" and "hopeless" suffering added to the theme introduction text.
6	Missing frequency of answer option.	Extra frequency option added.
7 & 8	Missing answer options.	Open answer option added. Additional answer option added to question 8.
9	Definition of "a healthy animal" is missing.	Definition added in the subtext of the question.
10	Missing frequency of answer option.	Extra frequency option added.
11 & 12	Missing answer options. Multiple issues addressed within one answer option.	Open answer option added. Separation and reformulation of answer options.

4.4.2 Opinions (statements)
To get further insight into the relevance of the eight considerations that may influence the decision-making process, statements of the research of Hartnack et al.(3) were used. Although these statements are not about the decision-making process around euthanasia, they do address how veterinarians deal with euthanasia in general and several of the eight considerations are reflected. So again, the

predetermined independent variables of our study were used to see if they could be linked to the statements. Based on these variables, nine statements could be adapted to our questionnaire.
The research of Hartnack et al. (3) also showed that veterinarians gave ambivalent answers to statements concerning experience with euthanasia, and this topic is also closely related to the first theme of our questionnaire: "personal experiences". As we suspect that experience with euthanasia might also influence the decision-making process of veterinarians, we decided to adapt another two statements of Hartnack's study. This resulted in a total of eleven statements, which we supplemented with three statements about personal beliefs regarding euthanasia. The statements concerning personal beliefs were adapted from a previous master thesis (21) and were included because we wanted to avoid ruling out that this factor may also influence the decision-making process. As a result, fourteen statements were included which were divided into four subthemes: "personal beliefs", "experience with euthanasia", "animal welfare & quality of life", and "bond between animal & owner" (*questions 13-17*). Three statements could not be categorised in the subthemes and were grouped together in the theme "other considerations". The respondents are asked to what extent they agree with the statements regarding euthanasia and can indicate their level of agreement on a 9-point Likert-scale. Further explanation about this rating-scale can be found in *Chapter 4.6.*

After conducting the pre-test, it became clear that all respondents struggled with interpreting the statements and therefore could not give a good reflection of their level of agreement. The statements were perceived as complex, due to ambiguous wording and inconsistency in the underlining of words. In order to solve this, the statements now are formulated in a similar way per theme and also similar words are underlined. Moreover, multiple pre-test respondents indicated that in question 15, the statement about analgesia and suffering seemed confusing. The statement was originally formulated as: "Effective analgesia makes it easier for me to deal with an animal's suffering". But in response to the feedback, it has been rephrased to: "It is easier for me to accept that an animal cannot fully perform its natural behaviour anymore, if I know that pain is minimal or even absent as a result of effective analgesia." The same feedback was received about the first statement of question 17. The formulation of this question was changed from: "When an animal is suffering and the current situation cannot continue, euthanasia is an acceptable option for me if treatment is medically, socially or economically complicated." to: "It is easier for me to deal with euthanasia when the treatment is medically, socially or economically complicated and the animal is suffering". *Table 5* shows a summary of the received feedback and implemented adjustments.
As a final point, in an online interview with one of the pre-test respondents, the respondent noticed that there may be not enough statements per factor to be able to draw conclusions from the results later. In order to confirm this, a factor analysis can be conducted (57). Since there was only limited time left to incorporate this into this questionnaire, the factor analysis was disregarded for now.

Table 5: Summary of received feedback and the adjustments that were made. The final version of the statements can be found in Appendix 2.

Received feedback in pre-test	**Implemented adjustments in final questionnaire**
Complex and ambiguous wording of statements. Inconsistency in statement formulation.	Reformulation of statements. Similar formulation of statements within the themes.
Inconsistent use of underlining of words.	Underlining of similar words within the themes.
Confusing statements in question 15 and 17.	Rephrasing of both statements.
Possibly too few statements per factor to be able to draw conclusions from the results later.	Disregarded for now.

4.4.3 Vignette design

Before designing the case scenarios for the vignettes, we had to decide which vignette design was most suitable to answer our research questions. Two previous studies using vignettes to research decision-making processes in the medical field were reviewed (18,35). In the study of Doidge et al.(35), concerning the antibiotic prescription behaviour of veterinarians, a factorial survey design was used to determine the importance of seven variables (see *Figure 2*). One of the variables consisted of four levels, while the other six variables consisted of two levels. A vignette universe was created by randomly combining the variable levels and each respondent was randomly assigned to eight

vignettes. Since the goal of our research is to determine the relevance of eight variables, initially a similar design seemed the best option. However, while designing the levels of each variable, it became clear that the factorial survey design did not fit the nature of our research. Unlike the variables used in the study by Doidge et al.(35), it was not possible to assign levels to the predefined variables in such a way that by combining these levels, logical cases could still be constructed. Especially the levels "animal welfare" and "Quality of life" were difficult to translate into levels. This is due to the fact that these terms are often determined by several factors and therefore cannot be described in just one sentence.
As a result of the aforementioned, the vignette design of the KOPPEL study (18) seemed more suitable. In this study, each vignette consist of two dimensions and each dimension has two levels. In this way, each vignette was made into four different variations of that vignette. Part of the respondents was presented with one variant of a vignette, and the other part was presented with the other variant. This type of design can be classified as a between-subject design. However, the difference with our study is that we wanted to include eight, instead of two, different dimensions within the vignettes. This means that if we would choose to design two levels for each dimension, a total of 8^2=256 possible vignette variations can be created. A calculation was made to assess how many respondents would be needed in case we would choose the between-subject design in comparison to the within-subject design (see *Table 6*).

Table 6: Comparison of the between-subject and within-subject design by using an example calculation.

Between-subject design	**Within-subject design**
Eight dimensions with each 2 levels: 8^2=256 vignette variations possible	
Respondents are randomly assigned to different groups, within these groups each respondent is presented with the same vignette. So one respondents reviews only one vignette.	All respondents are presented with a set of vignettes and each respondent views the same set. So one respondent reviews multiple vignettes.
Suppose each vignette has to be viewed by at least 1 respondent, this means that at least 256 respondents are needed. To get a higher statistical power you want each vignette to be viewed more often, say 5 times per vignette: this means 5x256=1280 respondents are needed.	Suppose you want each respondent to view a maximum of 8 vignettes. This means at least 256/8= 32 respondents are needed. To get a higher statistical power you want each vignette to be viewed more often, say 5 times per vignette: this means 5x32=160 respondents are needed.
1280 respondents are needed to review each vignette at least 5 times.	160 respondents are needed to review each vignette at least 5 times.
1280/160=8 times more respondents are needed in the between-subject design.	

This calculation example shows that to achieve the same statistical power, eight times more respondents are needed in the between-subject design compared to the within-subject design. Since we mentioned earlier that the response rate of online surveys is approximately 30-40% (53), many more people would have to be invited to the questionnaire in order to get a sufficient response. This may even exceed the number of veterinarians working in the Netherlands, as there are only about 4200 of them (58). In conclusion, the within-subject design seemed the most suitable design for our study. This means that every participant gets to see all vignette variations. However, to limit the vignettes that need to be assessed per person, it was decided that a veterinarian would only assess cases about animals within their specialisation. So for example an equine veterinarian only assesses vignettes about horses. On top of that, veterinarians in the Netherlands are generally specialised in only one discipline. When they have to assess a case scenario about an animal outside of their area of expertise, this can have an unintended influence on the decision-making process. Therefore, the answers are more reliable and the internal validity is increased if they only review cases within their expertise (21).

Case scenarios of previous research that showed a division among veterinarians were already classified as complex scenarios in a previous master thesis (21). Since only case scenarios concerning equines and companion animals could be found in previous research (3,5), the case scenarios about farm animals were also based on the scenarios of the studies about equines and companion animals.

Initially, we tried to categorise the cases formulated in the previous master thesis (21) into dimensions and levels. However, in the existing cases it was not possible to extract levels for each dimension. As a result, the cases had to be rewritten in such a way that the levels of each dimension could be varied and still form logical cases. In order to do so, first the cases were divided into three themes based on research of Springer et al. (5) and Hartnack et al.(3). The themes are: "euthanasia request (convenience euthanasia)", "owners' refusal to euthanise" and "responsibility of the veterinarian in the decision-making process". Then, the already existing cases were modified so that each case formed a vignette with two dimensions and two levels per dimension. So eventually, for each discipline one vignette was designed per theme and each vignette had four different variations. Since we decided to incorporate only two variables per vignette, not all predetermined variables could be included. However as described earlier, in order to research the influence of these variables they were also included in the questions and statements of the other themes within questionnaire
In *Table 7*, the variables that were incorporated in the case scenarios are shown per vignette. Per discipline, the same variables were included per theme, although in some vignettes other variables like age and prognosis were included as well. However, these are fixed per vignette and thus only the other variables we want to investigate are varied within the vignettes. The variables and cases are similar for the different disciplines, in order to compare the results with each other. For the farm animals, it was not possible to design a realistic vignette that includes the variables "age" and "euthanasia request" in the same context as the equine and companion animal vignettes. It is quite rare that a veterinarian finds himself in the situation in which he has to make the decision himself to euthanise an animal because there is no one present at the farm. Therefore, it was decided to not include this vignette.

Table 7: Summary of variables that are incorporated into the vignettes. The variables that are shown in italics, also featured in the vignettes but were not incorporated as a dimension and are therefore not varied within the vignettes. The final vignettes can be found in Appendix 3.

	Vignette 1: Euthanasia request (convenience euthanasia)	**Vignette 2: Owners' refusal to euthanise**	**Vignette 3: Responsibility of the veterinarian**
Equine	Prognosis Financial situation of owner	Quality of life Bond between animal and owner *Prognosis*	Age Euthanasia request *Prognosis and animal welfare*
Companion animal	Prognosis Financial situation of owner *Age*	Quality of life Bond between animal and owner *Prognosis*	Age Euthanasia request *Prognosis and animal welfare*
Farm animal	Prognosis Financial situation of owner *Age*	Quality of life Bond between animal and owner *Prognosis*	

For each variation of the vignettes, the veterinarians are asked "To what extent do you agree with euthanasia in this case?" and they can indicate their level of agreement on a 9-point Likert-scale. Where 1= I reject euthanasia in this case and 9= I fully agree with euthanasia in this case. The reasoning behind the choice for this rating scale can be found in *Chapter 4.6.* As multiple of the pre-test respondents indicated that the initial question did not apply to every case, it was reformulated to: "What is your attitude towards euthanasia in this case?".

Only the three equine case scenarios were presented to all of the pre-test respondents. This was done because we initially only wanted to test which presenting style of the cases was considered to be most pleasant. The three cases were presented in three different ways and then the respondents were asked which way they found most pleasurable to read. The different presentation styles are displayed in *Figure 3.* Four of the respondents preferred presentation style 1, none of the respondents preferred presentation style 2 and five of the respondents preferred presentation style 3. The other respondents had no preference. Because four respondents also specifically stated that they had experienced the first way as unpleasant to fill in, it was decided to use the third style in the final questionnaire. It must be said, however, that none of the presentation styles eventually seemed to be entirely suitable for the cases.

In order to test the content of the vignettes, the cases for each discipline were sent to veterinarians of the corresponding discipline and then the veterinarians were asked for feedback. They were specifically asked whether they thought the presented cases were realistic and if they were able to answer the question properly. What came up most often in the feedback was that veterinarians asked for certain details about the cases, which they felt they needed in order to answer the question better. Based on this, details were added to the vignettes, such as a lameness score, the severity of the symptoms and the age and breed of the animal. In addition, in the introduction section of the case scenarios, a sentence has been added to point out that the researchers are aware that there may be other possibilities in real-life, but that we would like them to try and answer the question as best they can with the provided information.
Because some cases were not realistic enough or did not sufficiently explore the (possible) conflicting factors, a few cases have been rewritten. This resulted in that equine cases 1 and 3, and companion animal case 3 are still based on previous literature (3,5). However, the remaining cases are newly designed cases, in which we attempted as much as possible to compose them similar to the aforementioned cases. The final version of the vignettes can be found in *Appendix 3*.

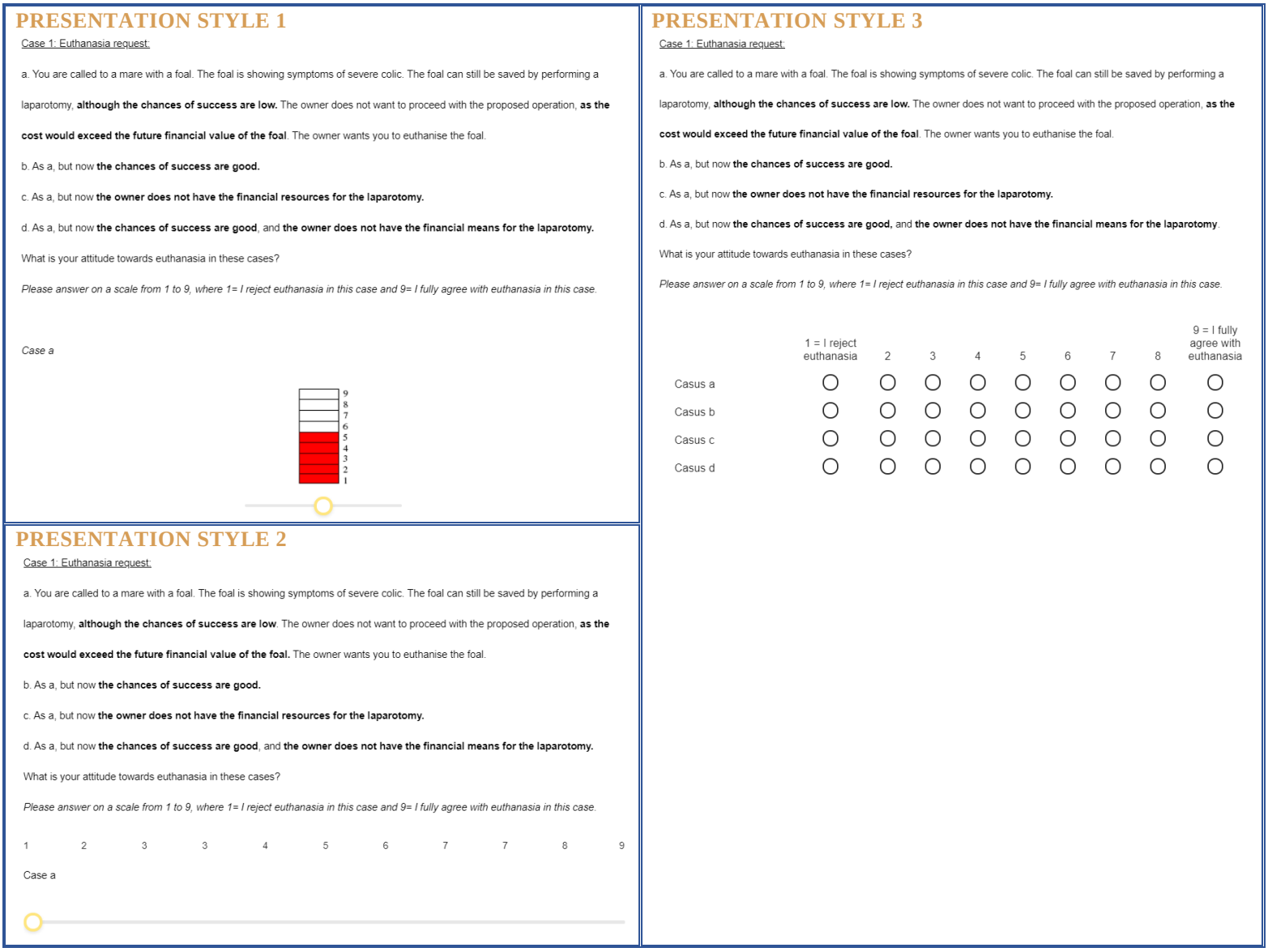


Figure 3: Example of the different presentation styles in Qualtrics that were used to present the case scenarios in the pre-test (54).

4.4.4 Demographics

Demographic questions can be used to identify the characteristics of the respondents. These characteristics may influence the opinion of respondents. And moreover, they help determine whether the respondents who participated in the questionnaire are a representative sample of the target population. The following demographic factors were taken into account in this questionnaire: age, gender, years of working experience, working region and in which discipline the veterinarian works (equines, companion animals, or farm animals) (3,5,7).

4.5 Question order and formulation

The question order and formulation are based on general questionnaire guidelines on how to construct a questionnaire. These guidelines were established in the previous master thesis of Smit and Deelen (21) and are based on scientific literature (43,47,48). It is recommended to start a questionnaire with easy questions, in order to introduce the respondents to the subject. Then more complex and sensitive questions can follow, although the questionnaire should not end with too complex questions. This is because at the end of the questionnaire the respondent may be tired and this can influence the reliability of the answers that are given (43).

Initially, the questionnaire of this research started with two questions about how often veterinarians perform euthanasia and how often they have conversations with owners about whether to euthanise an animal or not. Then more personal and sensitive questions were asked and the questionnaire ended with the demographic questions. The pre-test showed that respondents felt more comfortable when answering first a few demographic and therefore less sensitive questions, before moving on to the questions about euthanasia. Although, the first two questions about euthanasia were perceived to be good questions to enter the subject. So it was decided to start with two demographic questions about how many years of working experience the veterinarian has and in which discipline the veterinarian works. This was also considered more convenient, since knowing in which discipline the veterinarian works is necessary to ensure that the routing of the questionnaire is conducted in such a way that the respondent is presented with the correct cases (equine, companion animal or farm animal).

As respondents can also be influenced by the wording of the questions and answer options, the BRUSO-model can be used to increase the reliability and validity of their responses. This means that the answer options should be Brief, Relevant, Unambiguous, Specific and Objective (48). In *Table 8* a more detailed explanation of the BRUSO-model is displayed. This model was used while designing the questionnaire. Although attention was given to the wording of the questions, the pre-test showed that almost all respondents struggled with the formulation of several questions and statements. Based on the received feedback, the questions were reviewed and evaluated again. Adjustments were made by reformulating the questions using the BRUSO-model again and also by applying more consistency in the way the questions were formulated. In addition, in the statements and also in some questions, words have been underlined to clarify the subject of the statement or question.

Table 8: The BRUSO-model (21,48).

Brief	Questions should be to the point, and long, overly technical and unnecessary words should be avoided.
Relevant	Questions should be relevant to the research question, in this way it can be prevented that respondents get annoyed by irrelevant questions.
Unambiguous	Questions should be formulated in such way that they can only be interpretated in one way, in order to get reliable answers from the respondents.
Specific	Questions have to be clear and should address only one issue. If two issues are being researched, these two issues should be separated into two questions.
Objective	Questions should not lead respondents in a certain direction or reflect the opinion of the researcher.

4.6 Rating scales

Several rating scales were used in the questionnaire. The definition of a rating scales is an ordered set of responses that respondents must choose from in order to answer the question (48). In questions 4 and 5 a five-point rating scale has been used. These five-point scales are most suitable for unipolar scales where only one construct, like frequency, is being researched (48). As the goal of questions 4

and 5 was to get an overall impression on how often veterinarians encounter positive and negative experiences regarding euthanasia, the scale-points were divided into “never, rarely, sometimes, often, always”.
For the statements and case scenarios, another kind of rating scale was used. As we wanted to measure the level of agreement of the respondents towards the statements and case scenarios, we used a 9-point Likert-scale. This is a type of scale that is being used to measure the respondents’ attitude towards something, by asking their level of agreement on several statements about a subject (48). The nine points range from “I completely disagree” to “I completely agree” and numbers are assigned to each response option. One can also choose to use a 7-point Likert-scale, but a 9-point Likert-scale is more reliable and valid, as it gives a better reflection of the true opinion of the respondent (48). In this questionnaire, only scale points 1, 5 and 9 have verbal labels, while the other labels on the scale have numerical labels. This was mainly done because the design of Qualtrics (54) did not enable to label all scale points with verbal labels in an well-ordered way.

4.7 Overall impression of the questionnaire design

The pre-test respondents were asked what their overall impression was of the questionnaire design. All respondents said they found the questionnaire user-friendly and that the questions were well varied throughout the questionnaire. In addition, they found the length of the questionnaire appropriate for the subject matter and the type of questions asked. The average time needed by the pre-test respondents to complete the questionnaire was about 15-20 minutes. An exact average cannot be given, because the times recorded in Qualtrics are not reliable since the pre-test participants also spent time giving feedback on the questionnaire while filling in the questionnaire.

5. Discussion

5.1 Validity, reliability and study limitations

This study aimed to design a well-founded questionnaire that can be used to gain insight into the decision-making process of veterinarians regarding complex euthanasia cases. To obtain useful results, the questionnaire has been designed to maximise reliability and validity. However, the design of this study also has some study limitations.

Firstly, the questionnaire was designed in a similar way as previous studies on the same subject (3,5,18). This means that the questions are based on this literature and that the variables that were used within the questions and case scenarios were identified from previous research about decision-making regarding euthanasia of animals (3,5,7). While designing the questionnaire, three more factors were found in literature that might influence the decision-making process: relationship with colleagues, experience with euthanasia and personal beliefs (3,5,21). Because we did not want to rule out these potentially important factors, it was decided to include statements and questions that reflected these factors as well into the questionnaire. Depending on the future results of the questionnaire, the relevance of these factors may be researched further, for example through in-depth interviews of focus groups. In addition, it is important to mention that it was eventually decided to newly design part of the vignettes and that these are therefore not validated by previous research. But to increase validity, the vignettes were assessed by several veterinarians.

In general, it is recommended anyway that questionnaires and vignettes are assessed by several experts in the respective field (33,36,52). In this study, this was done by conducting a pre-test in which multiple veterinarians were asked to review the questionnaire. It is worth mentioning that after conducting the pre-test, the general impression is that veterinarians give varying answers to the vignettes. We already noticed that veterinarians with less work experience view the cases differently than veterinarians with more work experience or specialists. Since we wanted to present complex cases, this goal seems to have been achieved

The pre-test also contributed to increasing validity by testing whether the BRUSO-model (48) had been applied correctly. As mentioned in *Chapter 3.4* the sample size that was used for the pre-test was too small, which may have decreased the power to detect relatively common prevalent problems that respondents may encounter while filling in the questionnaire. However, to compensate for this, in-depth interviews were held with part of the respondents and we deliberately asked people who are experienced in questionnaire research to participate in the pre-test. After identification of problems and modification of the questionnaire, ideally another round of pre-test should be conducted (52). Due to time limitations, however, a second feedback round was not conducted in this study.

To increase the reliability of the questionnaire, the various considerations (factors) that are being researched, are reflected in multiple statements. Also, some (parts of) questions in the theme “personal experiences” are repeated. This is in order to measure whether the respondents are consistent in their answers. As mentioned before, to make sure there are enough statements per factor to be able to draw conclusions from the results, a factor analysis should be conducted. Since this has not been done yet, the results from the statements may be not reliable yet.

A positive contribution to the reliability, however, is the use of rating scales. In several of the questions, 9-point Likert-scales are being used to measure the respondents’ attitudes towards the statements and case scenarios. As mentioned before in *Chapter 4.6*, this type of scale was used because it gives a more reliable reflection of the respondent’s true opinion. Another advantage of using the 9-point Likert-scale, is that in the studies that were used to obtain the statements and case scenarios, also 9-point Likert-scales were used (3,5). By using the same rating scales in this questionnaire, this provides the opportunity to compare some of the results of this study with the previously mentioned studies. However, it should be taken into account that some of the questions and statements have been modified to better fit our study. Results may therefore only be compared if the original question formulation has remained exactly the same.

A study limitation related to the rating scales may be that we chose not to label all scale points with a verbal label. Literature on questionnaire research shows that more reliable results are obtained if all scale points are verbally labelled (48). The design of Qualtrics was the main reason not to do this. In

addition, none of the presentation styles that were used for de case scenarios seemed to be entirely suitable for the cases. Therefore, it must be considered that Qualtrics may not be the best online survey tool to use for this questionnaire.
An advantage of using an online survey tool for the questionnaire is that it is very easy to let the respondents fill in the questionnaire anonymously. Since the questionnaire addresses a sensitive topic, respondents may feel less uncomfortable if they can complete the questionnaire anonymously. This decreases the chance on social desirability bias and contributes to the validity and reliability of the results. Another advantage of an online survey tool is that Qualtrics provides a quite adequate estimate of the time it takes to complete the questionnaire. The duration of our questionnaire is approximately 15-20 minutes, which was perceived by the pre-test participants as appropriate for the subject of the questionnaire. Literature also shows that a questionnaire should preferably not be longer than 20-30 minutes (43,46). This way, the response rate is increased and it can be avoided that only people who are interested in the topic fill in the questionnaire, as this may create a bias and decrease the external validity.
In this study, the focus was not on determining the sample size, as this has already been extensively discussed in the previous master thesis on this topic (21). However, several choices in the design of the questionnaire were made based on the sample size that is expected to be used. For example, in *Chapter 4.4.3* it is explained that we chose to use a within-subject design for the vignettes, to avoid needing a large sample size to reach sufficient statistical power. Since this study aims to get a better insight into which considerations and to what extent these considerations are important, and not to know how the average Dutch veterinarian makes a euthanasia decision, the question is whether the size of the sample is important at all (21). And with that, one can also wonder whether the type of vignette design matters. We want to know how a respondent's opinion changes when one of the factors is varied within a vignette. So we are not interested in how often this happens among all participants in the survey. A small sample size may already be sufficient to get insights into the decision-making process, although to get a wide range of perspectives and experiences it is recommended to take a random sample (46,50). This is why in the demographic questions of this questionnaire the respondents are asked to indicate in which region in the Netherlands they work. If many veterinarians from the same region complete the questionnaire and veterinarians from other certain regions do not, the sample taken may not be random enough and the results may be biased.
Finally, this study including the design of the questionnaire was conducted by a veterinary student and her supervisor who is a veterinarian. Although literature on social sciences was used, we are not specialised in this field. This can be considered as a study limitation, since we are not trained in interpreting and analysing literature in the field of social sciences.

5.2 Recommendations for future research

As mentioned in the previous section, due to time limitations some aspects of the questionnaire design have not yet been (completely) implemented. We recommend performing a factor analysis before distributing the questionnaire to veterinarians. After conducting the factor analysis and making the necessary modifications, it is recommended to pre-test the questionnaire again.
Also, a concept version of an information letter for participants has been designed. The concept version can be found in *Appendix 4.* This information letter can be sent along with the invitation to the questionnaire that will be sent to veterinarians. It contains information about the goal of the research, gives a short overview of the content of the questionnaire and provides information on how the data obtained from the questionnaire will be processed. Information that still has to be included is how long and how the data will be stored. This depends on the data management plan, which has not yet been set up. Other information that has to be added is the deadline for completing the questionnaire and whether and where respondents can eventually find the results of the study. We expect that sending a short information letter along with the questionnaire invitation will help to attract veterinarians' attention and will motivate more veterinarians to complete the questionnaire.
Finally, it is recommended to organise focus groups or in-depth interviews after obtaining the results. The results of this questionnaire will give an overview of which considerations and to what extent influence the decision-making process around euthanasia. However, the questionnaire only included predefined considerations, supplemented by some considerations that we suspected might also play a role (relationship with colleagues, experience with euthanasia and personal beliefs). Additionally, in

some questions, the option is given to respondents to fill in their own answers. The results may therefore reveal additional considerations that also influence the decision-making process. To obtain further insight into the relative importance of these considerations, interviews and focus groups may be useful since this can provide more in-depth perspectives on social processes like decision-making (43). Just as was done in the KOPPEL-study, part of the respondents that filled in the questionnaire can be invited for these focus groups or in-depth interviews (18). To ensure that respondents remain anonymous, a link can be inserted at the end of the questionnaire that directs them to a new questionnaire. In this new questionnaire, respondents who are interested in participating in the follow-up study can then leave their contact details.

6. Conclusion

The aim of this study was to design a questionnaire to gain insight into the decision-making process of veterinarians regarding complex euthanasia cases, by finding out which considerations and to what extent, influence the decision-making process around these complex cases. Since the questionnaire addresses a sensitive topic, it was concluded that a vignette-based research method is the best way to obtain reliable results with as little social desirability bias as possible. Eight considerations that influence the decision-making process were found in previous literature and have been implemented into the vignettes. Not all considerations could be included in the vignettes, however to compensate for this, the considerations are also reflected in the other questions of the questionnaire.
The case scenarios of the vignettes and the other questions in the questionnaire are based on scientific literature from the humane and veterinary medical field that focussed on the same topic. As a result of the findings in this literature, it was decided to divide the questionnaire into four themes: personal experiences, opinions, case scenarios and demographics. An important finding of our study is that during the further design of these themes, three other considerations were found in literature that might influence the decision-making process: relationship with colleagues, experience with euthanasia and personal beliefs. Questions and statements that reflected these considerations were also included in the questionnaire.
Since some of the case scenarios have been modified or newly designed, this may be a threat to the validity of the questionnaire. However, by conducting the pre-test and having the case scenarios reviewed by veterinarians, it has been ensured that the case scenarios are realistic and more important, serve their purpose. That is, to ensure that the case is perceived as complex and that the respondent must weigh up the factors given to him/her to decide whether the animal should be euthanised or not. The results will give further insight into this decision-making process, although the complexity of this process can probably not be fully understood based on the questionnaire results alone. Therefore, focus groups or in-depth interviews can be conducted to get further insight into the process.
Altogether, the result of this study is a well-founded questionnaire including vignettes that can be used to gain insight into the decision-making process of veterinarians regarding complex euthanasia cases. There are still some adjustments needed for improvement, including a factor analysis and another pre-test round, but then the questionnaire is ready to be distributed among Dutch veterinarians.

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Appendix 1 - Pre-test evaluation form

Beste,

U ontvangt deze e-mail omdat u door Ellen Deelen of door Dewi Timmers bent benaderd om deel te nemen aan de pre-test van ons onderzoek: 'Een mooi hulpmiddel of een noodzakelijk kwaad? Onderzoek naar dilemma's rondom euthanasie'. Hiervoor vragen we u om de enquête in te vullen die via de link onderaan in deze e-mail te bereiken is.

Informatie over de pre-test
In deze pre-test gaat het voornamelijk om de leesbaarheid en duidelijkheid van de vragen, hier ontvangen we dan ook graag feedback op. Hierbij is het van belang om de enquête in te vullen zoals u dat bij een echte enquête ook zou doen, zodat wij kunnen evalueren welke aanpassingen nodig zijn om betrouwbare resultaten te verkrijgen wanneer we de enquête gaan uitzetten onder respondenten. De antwoorden die u geeft zullen direct na de evaluatie van de pre-test worden verwijderd en zullen niet worden meegenomen in de resultaten van ons onderzoek.

Wat vragen we van u?
- Het lezen van de 'informatiebrief voor deelnemers'
- Het invullen van de enquête.
- Het beantwoorden van onderstaande vragen

Naar verwachting kost het invullen van de enquête ongeveer 15-20 minuten.

Vragen ter evaluatie van de enquête
We zijn erg benieuwd naar uw feedback op onderstaande punten:
- Informatiebrief voor deelnemers:
  - Welke informatie mist u nog in de 'informatiebrief voor deelnemers?
  - Is het doel van het onderzoek duidelijk?
- Vragenlijst:
  - Zijn de vragen gemakkelijk leesbaar en is de vraagstelling duidelijk? Indien nee, wat is er nodig om dit te verbeteren?
  - Bij vraag 7/8/11/12: mist u hier nog antwoordopties? Zo ja, welke?
  - Bij vraag 13 t/m 17: zijn de stellingen duidelijk en gemakkelijk leesbaar? Indien nee, wat is er nodig om dit te verbeteren?
- Casussen:
  - Geven de casussen voldoende context om de bijbehorende vraag te kunnen beantwoorden?
  - De casussen worden op 3 verschillende manieren aan u voorgelegd, welke manier vindt u het prettigst lezen en invullen?
- Algemeen:
  - Hoe heeft u het invullen van de vragenlijst en de tijd die hiervoor nodig was ervaren?
  - Waren de vragen afwisselend genoeg?

Link naar de online enquête:
https://survey.uu.nl/jfe/form/SV_damTqCNAHCj15MG

Zou u ons uiterlijk 31 maart de schriftelijke feedback op bovenstaande vragen willen sturen?
Bij voorbaat hartelijk dank voor uw interesse en inzet!

Met vriendelijke groeten,
Ellen Deelen & Dewi Timmers

Appendix 2 – Final questionnaire

Een mooi hulpmiddel of een noodzakelijk kwaad?

Onderzoek naar dilemma's bij dierenartsen rondom euthanasie van dieren

Beste meneer/mevrouw,

Hartelijk dank voor uw interesse in het invullen van deze vragenlijst. Deze vragenlijst maakt onderdeel uit van onderzoek naar dilemma's rondom complexe euthanasiecasussen. Euthanasie wordt vaak als een stressvol onderdeel van de praktijk ervaren, daarom vinden wij het belangrijk om inzicht te krijgen in de overwegingen die van invloed zijn op het besluitvormingsproces rondom euthanasie. Op deze manier vinden we mogelijk aanknopingspunten om dierenartsen in de toekomst handvatten te kunnen bieden wanneer zij te maken krijgen met complexe euthanasie casussen.
Hiervoor vragen wij u om deze vragenlijst in te vullen, het invullen hiervan duurt ongeveer 15-20 minuten. In deze vragenlijst vragen we eerst naar uw eigen ervaringen met euthanasie van dieren. Vervolgens leggen we u een aantal stellingen voor. De vragenlijst sluit af met een aantal korte praktijkvoorbeelden waarover we uw mening vragen.

Na afloop van de vragenlijst is er gelegenheid om uw vragen en/of opmerkingen over deze vragenlijst of over ons onderzoek achter te laten.

Alvast heel hartelijk dank voor uw tijd en waardevolle bijdrage aan dit onderzoeksproject.

Toestemming en privacy
De resultaten van dit onderzoek worden anoniem verwerkt en wij gaan zorgvuldig om met uw persoonsgegevens.
Door op 'volgende' te klikken neemt u deel aan de vragenlijst en verklaart u het volgende:

- Uw deelname aan dit onderzoek is op vrijwillige basis.
- U bent 18 jaar of ouder.
- U bent ervan op de hoogte dat er wordt gevraagd naar persoonlijke gegevens, waaronder: in welke discipline u werkzaam bent, sinds welk jaar u werkzaam bent als dierenarts en in welke provincie u woont.
- U bent ervan op de hoogte dat u de vragenlijst op elk moment kunt stoppen.

○ Ik ga akkoord met bovenstaande informatie

Uitleg begrippen
Voorafgaand aan de vragenlijst willen we graag verduidelijken welke definities we aanhouden van de volgende begrippen:

Euthanasie: het beëindigen van het leven van een individueel dier op een manier die pijn en leed minimaliseert of elimineert. (20)

Diereigenaar/veehouder: hieronder vallen eigenaren van gehouden gezelschapsdieren, paarden en landbouwhuisdieren. In het vervolg zal worden gesproken over 'diereigenaar'.

Algemene gegevens

Sinds welk kalenderjaar bent u werkzaam als dierenarts?

_____

In welke discipline bent u werkzaam?

- ○ Landbouwhuisdieren
- ○ Paard
- ○ Gezelschapsdieren
- ○ Gemengd

[De volgende vraag verschijnt alleen indien hierboven is gekozen voor 'gemengd']
U heeft aangegeven dat u werkzaam bent in meerdere disciplines, geef hieronder aan in welke disciplines u werkzaam bent.

	Landbouwhuisdieren	Paard	Gezelschapsdieren
In welke discipline bent u het meest werkzaam (meer dan 60% van de tijd)?	☐	☐	☐
In welke discipline bent u daarnaast werkzaam? (meerdere antwoorden mogelijk)	☐	☐	☐

Eigen ervaringen
Euthanasie van dieren speelt een belangrijke rol in de dierenartsenpraktijk. Hoewel dierenartsen zijn opgeleid om op basis van de gezondheid en het welzijn van een dier te beoordelen of euthanasie al dan niet de juiste keuze zou zijn, blijkt het besluitvormingsproces hiertoe vaak complex. We willen graag van u weten welke ervaringen u heeft met euthanasie en wat van invloed is op uw besluitvormingsproces.

Er wordt in een aantal vragen gesproken over ondraaglijk en uitzichtloos lijden. Binnen deze vragenlijst houden wij de volgende definities aan:

Ondraaglijk lijden: Er is sprake van ondraaglijk lijden wanneer het op basis van (klinische) waarnemingen invoelbaar is dat een dier zodanig in zijn welzijn is aangetast dat dit voor het dier ondraaglijk zou kunnen zijn. Hierbij kan het gaan om pijn, stress, lijden of inperking van het uitoefenen van natuurlijk gedrag. (55)

Uitzichtloos lijden: Er is sprake van uitzichtloos lijden indien de ziekte of aandoening die het lijden veroorzaakt niet te genezen is en het ook niet mogelijk is de symptomen zodanig te verzachten dat daardoor de ondraaglijkheid van het lijden verdwijnt. (55)

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1. Hoe vaak voert u gemiddeld euthanasie van een dier uit? (3)

- ○ <1 keer per maand
- ○ 1-5 keer maand
- ○ 5-10 keer per maand
- ○ >10 keer per maand
- ○ Ik voer nooit euthanasie uit, dit heeft als reden... [vul uw reden in] --> *wanneer deze antwoordoptie wordt gekozen, eindigt de vragenlijst via routing*
  _____’

2. Hoe vaak heeft u een gesprek met een diereigenaar over het al dan niet uitvoeren van euthanasie van een dier?

- ○ <1 keer per maand
- ○ 1-5 keer maand
- ○ 5-10 keer per maand
- ○ >10 keer per maand

_____

3. Welke van onderstaande positieve ervaringen heeft u meegemaakt gedurende het besluitvormingsproces tot euthanasie? (18)
Er zijn meerdere antwoordopties mogelijk.

- ☐ Er was een goede vertrouwensrelatie met de diereigenaar.
- ☐ Er was respect van de diereigenaar voor mijn positie als dierenarts in het proces.
- ☐ Er werd gemakkelijk overeenstemming bereikt met de eigenaar van het dier over het te nemen besluit.
- ☐ Er was overeenstemming met collega's over het te nemen besluit.
- ☐ Ik voelde me gesteund door mijn collega's in het besluitvormingsproces.

---

4. Kunt u aangeven hoe vaak u onderstaande negatieve ervaringen heeft gehad gedurende het besluitvormingsproces tot euthanasie? (18)

	Nooit	Zelden	Soms	Vaak	Altijd
De vertrouwensrelatie met de diereigenaar had een negatieve invloed op het te nemen besluit	○	○	○	○	○
Er was verschil van mening met de diereigenaar over het te nemen besluit	○	○	○	○	○
Er was verschil van mening met collega's over het te nemen besluit	○	○	○	○	○
Ik had gewetensbezwaren	○	○	○	○	○
Ik voelde me onder druk gezet door de diereigenaar	○	○	○	○	○
Ik voelde mij gehinderd door mijn collega’s tijdens het besluitvormingsproces	○	○	○	○	○

---

5. Kunt u aangeven in hoeverre onderstaande redenen er in het verleden voor hebben gezorgd dat u een verzoek tot euthanasie niet heeft uitgevoerd? (18)

	Nooit	Zelden	Soms	Vaak	Altijd
Het dier overleed op natuurlijke wijze voordat euthanasie kon worden uitgevoerd	○	○	○	○	○
Ik was onvoldoende overtuigd dat het verzoek tot euthanasie goed doordacht was	○	○	○	○	○
Ik was onvoldoende overtuigd dat er sprake was van ondraaglijk lijden	○	○	○	○	○
Ik was onvoldoende overtuigd dat er sprake was van uitzichtloos lijden	○	○	○	○	○
Ik zag nog een redelijke andere oplossing	○	○	○	○	○
Ik zag te veel op tegen het uitvoeren van de euthanasie	○	○	○	○	○
Ik had gewetensbezwaren	○	○	○	○	○
De diereigenaar was het oneens met euthanasie	○	○	○	○	○
De diereigenaren waren het onderling oneens met euthanasie	○	○	○	○	○
Mijn collega's waren tegen euthanasie	○	○	○	○	○

---

6. Heeft u in het afgelopen jaar wel eens een euthanasie uitgevoerd, terwijl u hier eigenlijk niet achter stond? (7)

- ○ Ja, wekelijks
- ○ Ja, maandelijks
- ○ Ja, meerdere keren per jaar
- ○ Ja, jaarlijks of minder
- ○ Nee, nooit

[Vraag 7 en 8 zullen alleen verschijnen indien vraag 6 is beantwoord met 'ja']
7. Kunt u ook aangeven waarom u het niet eens was met euthanasie? (7)
Er zijn meerdere antwoordopties mogelijk.

- ☐ Ik was onvoldoende overtuigd dat het verzoek tot euthanasie goed doordacht was.
- ☐ Ik was onvoldoende overtuigd dat er sprake was van ondraaglijk lijden.
- ☐ Ik was onvoldoende overtuigd dat er sprake was van uitzichtloos lijden.
- ☐ Ik zag nog een redelijke andere oplossing.
- ☐ Ik had hier een andere reden voor, namelijk... [vul uw reden in]

_____

8. Wat is/zijn de reden(en) geweest dat u de euthanasie uiteindelijk toch wel heeft uitgevoerd? (7)
Er zijn meerdere antwoordopties mogelijk.

- ☐ Na overleg met collega's leek euthanasie toch de beste optie.
- ☐ De eigenaar had niet de financiële middelen om een behandeling in te stellen.
- ☐ De eigenaar had niet de ruimte of financiële middelen om een dier te houden dat niet meer geschikt was voor het gebruiksdoel.
- ☐ Ik voelde me onder druk gezet door de eigenaar.
- ☐ Ik was bang dat de eigenaar het dier anders zelf zou doden.
- ☐ Ik had hier een andere reden voor, namelijk... [vul uw reden in]

_____

9. Heeft u wel eens het verzoek gekregen om een gezond dier te euthanaseren? Zo ja, hoe vaak komt dit voor? (3)
Met een gezond dier wordt een dier bedoeld dat op dat moment in een goede lichamelijke conditie verkeert, vrij is van ziekte en in zich een staat van positief welzijn verkeert, doordat het zich actief aan zijn levensomstandigheden kan aanpassen. (56)

- ○ <1 keer per jaar
- ○ 1-5 keer per jaar
- ○ > 5 keer per jaar
- ○ Nooit

_____

10. Heeft u in het afgelopen jaar wel eens meegemaakt dat er niet tot euthanasie werd besloten, terwijl u dit wel de beste optie vond? (7)

- ○ Ja, wekelijks
- ○ Ja, maandelijks
- ○ Ja, meerdere keren per jaar
- ○ Ja, jaarlijks of minder
- ○ Nee, nooit

_____

[Vraag 11 en 12 zullen alleen verschijnen indien vraag 10 is beantwoord met 'ja']
11. Kunt u ook aangeven waarom u euthanasie wel als beste optie zag? (7)
Er zijn meerdere antwoordopties mogelijk.

- ☐ Ik vond dat er sprake was van ondraaglijk lijden en behandeling gaf onvoldoende effect en/of ging gepaard met onacceptabele bijwerkingen.
- ☐ Ik vond dat er sprake was van uitzichtloos lijden en behandeling gaf onvoldoende effect en/of ging gepaard met onacceptabele bijwerkingen.
- ☐ Ik zag geen andere redelijke oplossing.
- ☐ De eigenaar had niet de financiële middelen om een behandeling in te stellen, echter niks doen was niet (ethisch) verantwoord.
- ☐ Ik had hier een andere reden voor, namelijk... [vul uw reden in]

_____

12. Wat is/zijn de reden(en) geweest dat er uiteindelijk geen euthanasie werd uitgevoerd?
Er zijn meerdere antwoordopties mogelijk. (7)

- ☐ Het dier overleed op natuurlijke wijze voordat euthanasie kon worden uitgevoerd.
- ☐ De eigenaar gaf geen toestemming om euthanasie uit te voeren.
- ☐ Na overleg met collega's werd er uiteindelijk nog een andere redelijke oplossing gevonden.
- ☐ Na overleg met de eigenaar werd er uiteindelijk nog een andere redelijke oplossing gevonden.
- ☐ Ik had hier een andere reden voor, namelijk... [vul uw reden in]

_____

Opvattingen over euthanasie
Naast ervaringen die dierenartsen hebben met euthanasie, kunnen persoonlijke opvattingen mogelijk ook een rol spelen in het besluitvormingsproces. Hierna volgen een aantal stellingen met betrekking tot euthanasie. Wij willen graag van u weten in hoeverre u het eens bent met deze stellingen.

Persoonlijke overtuigingen
13. In hoeverre bent u het met de volgende stellingen met betrekking tot euthanasie eens? (21)
Geef antwoord op een schaal van 1 tot 9, waarbij 1= ik ben het volledig oneens en 9= ik ben het volledig eens.

	1 = volledig oneens	2	3	4	5 = neutraal	6	7	8	9 = volledig eens
Euthanasie zie ik als een mooi onderdeel van mijn beroep als dierenarts.	○	○	○	○	○	○	○	○	○
Euthanasie is het minst leuke onderdeel van mijn beroep als dierenarts.	○	○	○	○	○	○	○	○	○
Euthanasie zie ik als een emotioneel uitputtend onderdeel van mijn beroep als dierenarts.	○	○	○	○	○	○	○	○	○

Ervaring met euthanasie
14. In hoeverre bent u het met de volgende stellingen eens? (3)
Geef antwoord op een schaal van 1 tot 9, waarbij 1= ik ben het volledig oneens en 9= ik ben het volledig eens.

	1 = volledig oneens	2	3	4	5 = neutraal	6	7	8	9 = volledig eens
Het went voor mij niet om een dier te euthanaseren.	○	○	○	○	○	○	○	○	○
Als ik terug kijk wordt het voor mij steeds gemakkelijker om met euthanasie van een dier om te gaan.	○	○	○	○	○	○	○	○	○

Dierwelzijn & kwaliteit van leven

15. In hoeverre bent u het met de volgende stellingen eens?(3)

Geef antwoord op een schaal van 1 tot 9, waarbij 1= ik ben het volledig oneens en 9= ik ben het volledig eens.

	1 = volledig oneens	2	3	4	5 = neutraal	6	7	8	9 = volledig eens
Het is voor mij gemakkelijker om te accepteren dat een dier niet meer geheel zijn natuurlijk gedrag kan uitoefenen, als ik weet dat pijn minimaal of zelfs afwezig is door effectieve analgesie.	○	○	○	○	○	○	○	○	○
Het is voor mij gemakkelijker om met het lijden van een dier om te gaan, als ik weet dat ik mijn best heb gedaan voor het welzijn van het dier.	○	○	○	○	○	○	○	○	○
Het is voor mij gemakkelijker om met euthanasie om te gaan, als ik weet dat ik mijn best heb gedaan voor het welzijn van het dier.	○	○	○	○	○	○	○	○	○
Het is voor mij gemakkelijker om met euthanasie om te gaan als het dier een rijk leven heeft geleid tot aan zijn dood.	○	○	○	○	○	○	○	○	○

Relatie tussen dier en eigenaar

16. In hoeverre bent u het met de volgende stellingen eens?(3)

Geef antwoord op een schaal van 1 tot 9, waarbij 1= ik ben het volledig oneens en 9= ik ben het volledig eens.

	1 = volledig oneens	2	3	4	5 = neutraal	6	7	8	9 = volledig eens
Het is voor mij moeilijker om een dier zonder eigenaar te euthanaseren.	○	○	○	○	○	○	○	○	○
Het is voor mij gemakkelijker om een dier te euthanaseren, als ik zie dat de eigenaar geen nauwe band met zijn dier heeft.	○	○	○	○	○	○	○	○	○

Overige afwegingen

17. In hoeverre bent u het met de volgende stellingen met betrekking tot euthanasie eens?(3)
Geef antwoord op een schaal van 1 tot 9, waarbij 1= ik ben het volledig oneens en 9= ik ben het volledig eens.

	1 = volledig oneens	2	3	4	5 = neutraal	6	7	8	9 = volledig eens
Het is voor mij gemakkelijker om met euthanasie om te gaan, wanneer de behandeling medisch, sociaal of economisch gezien gecompliceerd ligt en het dier aan het lijden is.	○	○	○	○	○	○	○	○	○
Het is voor mij gemakkelijker om met euthanasie om te gaan, als ik weet dat het dier nog maar kort zou hebben geleefd.	○	○	○	○	○	○	○	○	○
Het is voor mij gemakkelijker om met euthanasie om te gaan, wanneer een dier een gevorderde leeftijd heeft.	○	○	○	○	○	○	○	○	○

Casussen
Hieronder volgen enkele casussen met bijbehorende vragen. Het gaat om verzonnen situaties, die u in werkelijkheid ook in de praktijk zou kunnen tegenkomen. Wij vragen u om aan te geven wat uw houding is tegenover euthanasie in de verschillende antwoordopties. We zijn ons ervan bewust dat dit papieren casussen zijn en dat er in de praktijk soms ook andere uitkomsten mogelijk zijn. We vragen u om met de gegeven informatie de vraag te beantwoorden.

Casus 1: Voorbeeld
Wat is uw houding ten opzichte van euthanasie in deze casussen?
Geef antwoord op een schaal van 1 tot 9, waarbij 1= ik ben tegen euthanasie in deze casus en 9= ik ben het volledig eens met euthanasie in deze casus.

[De verschillende casus variaties worden vervolgens hier genoemd]

	1 = tegen euthanasie	2	3	4	5= neutraal	6	7	8	9 = volledig eens met euthanasie
Casus a	○	○	○	○	○	○	○	○	○
Casus b	○	○	○	○	○	○	○	○	○
Casus c	○	○	○	○	○	○	○	○	○
Casus d	○	○	○	○	○	○	○	○	○

Persoonskenmerken
Ten slotte willen we u nog enkele vragen stellen met betrekking tot uw persoonskenmerken.

Wat is uw geslacht?

- ○ Man
- ○ Vrouw
- ○ Anders

Wat is uw geboortejaar?

_____

In welke provincie bent u werkzaam?

- ○ Groningen
- ○ Friesland
- ○ Drenthe
- ○ Overijssel
- ○ Flevoland
- ○ Gelderland
- ○ Utrecht
- ○ Noord-Holland
- ○ Zuid-Holland
- ○ Zeeland
- ○ Noord-Brabant
- ○ Limburg

U bent aan het einde van de vragenlijst. Hartelijk bedankt voor het invullen van deze vragenlijst en uw waardevolle bijdrage aan ons onderzoek!

Indien u nog vragen en/of opmerkingen heeft over deze vragenlijst of over ons onderzoek, kunt u deze hier achter laten:

_____

_____

_____

_____

_____

Appendix 3 – Final vignettes

Paard

Verzoek om euthanasie (convenience euthanasia)

a. U wordt geroepen bij een merrie met een veulen. Het veulen vertoont symptomen van ernstige koliek. Het veulen kan nog gered worden door middel van een laparotomie, **hoewel de kans op succes klein is**. De eigenaar wil de voorgestelde operatie niet laten uitvoeren, **omdat de kosten de toekomstige financiële waarde van het veulen zouden overschrijden**. De eigenaar wil dat u het veulen euthanaseert
b. Als a, maar nu **is er een goede kans op succes.**
c. Als a, maar nu **heeft de eigenaar hier niet de financiële middelen voor.**
d. Als a, maar nu **is er goede kans op succes** en **heeft de eigenaar hier niet de financiële middelen voor.**

Weigeren van euthanasie

a. U komt bij een fokmerrie van 12 jaar oud **die 6 maanden drachtig** is. De merrie heeft een tijd terug een fikse peesblessure opgelopen. Ondanks meerdere behandelingen en het geven van pijnstilling loopt ze steeds erger kreupel. Op dit moment geeft u haar een kreupelheidsscore van 4 uit 5 (59). U schat de kansen voor verder herstel van het been erg laag in. Omdat u naast nog meer pijnstilling geven niks meer kunt doen voor het paard, stelt u euthanasie voor. **De eigenaar wil de merrie niet laten inslapen omdat hij graag nog geld wil verdienen aan het veulen**.
b. Als a, maar nu is de fokmerrie al **op 10 maanden van de dracht**.
c. Als a, maar nu gaat het om **een eigenaar die een erg hechte band heeft met haar paard en nog geen afscheid wil nemen.**
d. Als a, maar nu is de fokmerrie al **op 10 maanden van de dracht** en gaat het om **een eigenaar die een erg hechte band heeft met haar paard en nog geen afscheid wil nemen.**

Verantwoordelijkheid van de dierenarts in het besluitvormingsproces

a. Je krijgt een telefoontje van een vrouw die de **21-jarige merrie** van vrienden verzorgt. De eigenaar is 3 dagen geleden vertrokken voor een trektocht en is niet bereikbaar. Je kent de merrie goed aangezien je haar al zes maanden behandelt voor ernstige astma. Het paard reageerde eerder goed op therapie en optimalisatie van het stalmanagement, maar ze gaat nu achteruit en reageert niet meer op behandeling. De merrie heeft op dit moment ernstige dyspneu. **De verzorgster weigert een beslissing te nemen over euthanasie** en kan je niet vertellen wat de eigenaar zou willen.
b. Als a, maar nu gaat het om een **13 jarige merrie.**
c. Als a, maar nu **vindt de vrouw dat deze situatie echt niet meer kan en vraagt u of het paard niet beter geëuthanaseerd kan worden.**
d. Als a, maar nu gaat het om een **13 jarige merrie** en **vindt de vrouw dat deze situatie echt niet meer kan en vraagt u of het paard niet beter geëuthanaseerd kan worden.**

Gezelschapsdieren

Verzoek om euthanasie (convenience euthanasia)

a. Een eigenaar komt met een kat van 1 jaar oud in uw praktijk. De kat heeft een aantal dagen geleden een corpus alienum (CA) gegeten en is hierdoor nu ernstig ziek. Het voorwerp kan niet worden uitgebraakt en is ook niet meer met een scope te verwijderen, waardoor operatief ingrijpen is geïndiceerd. Deze operatie is kostbaar voor de eigenaar. **Maar hoewel het CA zich op een ongunstige locatie bevindt, zijn er nog kansen op succes. De eigenaar wijst de therapie af omdat hij niet genoeg geld heeft.** Hij wil dat u de kat laat inslapen.
b. Als a, maar **nu bevindt het CA zich in de maag en is de prognose voor volledig herstel erg goed.**
c. Als a, maar nu **heeft de eigenaar wel voldoende geld, maar hij geeft aan dat hij het geld liever ergens anders aan besteedt.**
d. Als a, maar nu **bevindt het CA zich nog in de maag en is de prognose voor volledig herstel erg goed** en **heeft de eigenaar wel voldoende geld, maar geeft hij aan dat hij het geld liever ergens anders aan besteedt.**

Weigeren van euthanasie

a. Een fokker komt bij u in de praktijk met een 1,5 jaar oude labrador teef die **43 dagen** drachtig is. De hond is net aangereden door een auto en blijkt beiderzijds een luxatie van de iliosacraalgewrichten te hebben. Een echo van het abdomen laat bij alle vruchten tekenen van leven zien. Na operatief ingrijpen is de prognose erg goed, hoewel de hond waarschijnlijk niet op natuurlijke wijze zal kunnen bevallen. De operatie is echter vrij kostbaar voor de eigenaar en omdat de eigenaar hier niet de financiële middelen voor heeft is dit geen optie. **De eigenaar wil de teef direct euthanaseren om de teef verder lijden te besparen.**
b. Als a, maar nu is de teef al **op 58 dagen** van de dracht.
c. Als a, maar nu **wil de eigenaar de teef laten leven tot na de bevalling en haar euthanaseren zodra te pups geboren zijn.**
d. Als a, maar nu **is de teef al op 58 dagen van de dracht** en nu **wil de eigenaar de teef laten leven tot na de bevalling en haar euthanaseren zodra de pups geboren zijn.**

Verantwoordelijkheid van de dierenarts in het besluitvormingsproces

a. Een hondenoppas komt bij u in de praktijk met een Maltezer **van 15 jaar** die ademhalingsproblemen heeft. **U heeft 6 maanden geleden bij deze hond een kwaadaardige tumor verwijderd en u bent bang dat de hond longmetastasen heeft ontwikkeld.** De hond is nu duidelijk benauwd. De eigenaren zijn 3 dagen geleden vertrokken voor een trektocht en zijn niet bereikbaar. **De hondenoppas weigert een beslissing te nemen over euthanasie en kan u niet vertellen wat de eigenaren zouden willen** (3).
b. Als a, maar nu gaat het om een Maltezer **van 9 jaar.**
c. Als a, maar nu **kan de hondenoppas de situatie echt niet meer aanzien en vraagt of het niet beter is om de hond te euthanaseren.**
d. Als a, maar nu gaat het om een Maltezer van **9 jaar** en kan **de hondenoppas de situatie echt niet meer aanzien en vraagt of het niet beter is om de hond te euthanaseren**

Landbouwhuisdieren

Verzoek om euthanasie (convenience euthanasia)

a. U wordt door een vleesveehouder gebeld om te komen kijken naar een kalf van 1 maand oud. De moeder koe is op de poot van het kalf gaan staan en deze heeft hierdoor een **eenvoudige gesloten fractuur ter hoogte van zijn tibia.** De fractuur is goed te behandelen door een gipsverband aan te leggen. Dit verband moet elke 2-3 weken worden vervangen tot de fractuur voldoende is geheeld, wat doorgaans 6 tot 8 weken duurt (60). **De veehouder zegt dat hij behandelen niet de moeite waard vindt, omdat de kosten de financiële waarde van het kalf zouden overschrijden.** Hij vraagt u om het kalf te euthanaseren.

b. Als a, maar nu gaat het om een **eenvoudige open fractuur ter hoogte van de tibia.**

c. Als a, maar nu **geeft de veehouder aan dat hij op dit moment niet de financiële middelen en tijd heeft om extra zorg aan dit kalf te kunnen bieden.**

d. Als a, maar nu gaat het om een **eenvoudige open fractuur ter hoogte van de tibia** en **geeft de veehouder aan dat hij op dit moment niet de financiële middelen en tijd heeft om extra zorg aan dit kalf te kunnen bieden.**

Weigeren van euthanasie

a. U komt op een kinderboerderij bij een varken dat lijdt aan een chronische kroonrandontsteking**. Het varken wordt hiervoor al 2 weken behandeld, maar ondanks de behandeling knapt het varken niet op.** Het varken wordt gezien als hét icoon van de kinderboerderij en trekt veel bezoekers. **De eigenaar, medewerkers en bezoekers zijn erg gehecht aan het varken en euthanasie is volgens hen geen optie**. De eigenaar van de kinderboerderij geeft aan dat hij wilt dat u alles doet om het varken te redden.

b. Als a, maar nu **wordt het varken al 4 weken behandeld.**

c. Als a, maar nu **geeft de eigenaar van de kinderboerderij aan dat hij wil dat u het varken in leven houdt zodat de bezoekersaantallen niet zullen dalen.**

d. Als a, maar nu **wordt het varken al 4 weken behandeld** en **geeft de eigenaar van de kinderboerderij aan dat hij wil dat u het varken in leven houdt zodat de bezoekersaantallen niet zullen dalen.**

Appendix 4 – Concept version of the information letter for participants

Een mooi hulpmiddel of een noodzakelijk kwaad?

Onderzoek naar dilemma's bij dierenartsen rondom euthanasie van dieren

Binnen de diergeneeskunde is euthanasie een onderwerp wat bijna dagelijks ter sprake komt. Hoewel euthanasie enerzijds ervaren kan worden als iets moois, een hulpmiddel om dieren een waardig einde te geven of uit hun lijden te verlossen, kan het anderzijds ook als een last worden ervaren. Voornamelijk in casussen waarbij de keuze om tot euthanasie over te gaan niet zo zwart-wit is blijkt euthanasie een van de oorzaken van stress en burn-out klachten onder dierenartsen.

Wanneer we meer inzicht hebben in het besluitvormingsproces rondom euthanasie en wat daarin zorgt voor dilemma's, vinden we mogelijk aanknopingspunten om dierenartsen in de toekomst handvatten te kunnen bieden wanneer zij te maken krijgen met complexe euthanasie casussen.

Invullen van de vragenlijst

Om inzicht te krijgen in de overwegingen die van invloed zijn op het besluitvormingsproces rondom euthanasie, vragen wij u deze vragenlijst in te vullen. In deze vragenlijst vragen we eerst naar uw eigen ervaringen met euthanasie van dieren. Vervolgens leggen we u een aantal stellingen voor. De vragenlijst sluit af met een aantal korte praktijkvoorbeelden.

U bent naar verwachting ongeveer 15-20 minuten bezig met het invullen van de vragenlijst. Uw deelname aan het onderzoek is geheel vrijwillig. U kunt gedurende het invullen van de vragenlijst op ieder gewenst moment stoppen. De antwoorden die u tot op dat moment heeft ingevuld zullen niet worden meegenomen in de verwerking van de resultaten.
Bij de verwerking van deze vragenlijst blijft u volledig anoniem. De door uw gegeven antwoorden zullen strikt vertrouwelijk worden behandeld. Digitale gegevens zullen in beveiligde computerbestanden worden opgeslagen die alleen toegankelijk zijn voor de onderzoekers. Wanneer de resultaten uit deze vragenlijst verwerkt worden tot een publicatie zal uw naam of andere informatie geenszins naar u in persoon te herleiden zijn.

Wij hopen dat u bij wilt dragen aan dit onderzoeksproject om zo meer inzicht te krijgen in mogelijke handvatten voor de omgang met complexe euthanasie casussen.

Als u vragen heeft over uw deelname of suggesties heeft voor dit onderzoeksproject, dan kunt u contact opnemen met Ellen Deelen.

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Alvast heel hartelijk dank voor uw tijd en waardevolle bijdrage aan dit onderzoeksproject.

Dit onderzoek wordt uitgevoerd in opdracht van het Centre for Sustainable Animal Stewardship Faculteit Diergeneeskunde, Utrecht Universiteit