

Evaluation of the KNMvD guideline “Antimicrobial use in dry cow therapy”



Research Project Veterinary Medicine, Utrecht University
D.C.G. (Denise) van Eekelen BSc
Student-ID: 3907422
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Supervisors

Prof. Dr. T.J.G.M. Lam – *Utrecht University, Faculty of Veterinary Medicine, Dept. Farm Animal Health – Epidemiology, Infectiology and Health – Bovine mastitis management and milk quality*
&

Ms. E.T. Navis MSc – *Policy Officer Koninklijke Nederlandse Maatschappij voor Diergeneeskunde*

Prefatory note

Within the study programme of Veterinary Medicine at Utrecht University every student has to fulfil a research project during their master's programme. This paper is the final report of the research project carried out by D.C.G. van Eekelen at the Royal Dutch Society of Veterinary Medicine, abbreviated as KNMvD¹.

A study was done to evaluate the guideline 'Antimicrobial use in dry cow therapy', the first guideline introduced in veterinary medicine in the Netherlands, as developed by the KNMvD. The evaluation of the guideline is commissioned by the KNMvD, which has established a projectteam for this purpose. The student executed the evaluation in consultation with the projectteam. Members of this team provided the student with input and feedback. The content of this thesis is meant for educational purposes and to help the KNMvD to evaluate and, if applicable, improve the veterinary guidelines, specifically the guideline 'Antimicrobials used in dry cow therapy'.

¹ Royal Dutch Society of Veterinary Medicine, in Dutch: Koninklijke Nederlandse Maatschappij voor Diergeneeskunde (KNMvD).

Abstract

In January 2014 the guideline 'Antimicrobials used in dry cow therapy' (shortened as: guideline dry cow therapy) was introduced with the aim of giving tools for implementation of the Dutch legislation on banning prophylactic use of antimicrobials (in dry cow treatment) in daily practice. Because a thorough review of the guideline is important, the aim of this evaluation was to quantify the opinion of veterinarians on the guideline, to identify perceived bottlenecks and to propose possible improvements. To execute the study an online survey was chosen enabling all qualified bovine practitioners (in Dutch: geborgde rundveedierenartsen) to give their opinion on the guideline dry cow therapy. The public list of qualified bovine practitioners (of whom 166 dropped out) was used as recipient list. The invitation for the survey was repeatedly sent to the remaining 722 bovine practitioners, of whom 21 filled in the survey partly, while 159 filled in the survey completely (total response rate of 24,9%). Although it is never certain the participating veterinarians are completely representative for all bovine practitioners, the man/female distribution of the list of qualified bovine practitioners corresponded exactly with the distribution of respondents (72% male/28% female). Additionally, diverse ages, ranges of years of graduation, numbers of practitioners and dairy farms per practice were represented by the respondents to the survey.

In general, the opinions of bovine practitioners on the guideline dry cow therapy seem to be positive. Veterinarians responded positively to questions on clarity and communication of the guideline and most of them have been informed about the guideline by the communication paths from the KNMvD, which indicates these paths being effective. Besides this, the implementation rates of the guideline in veterinary practices (78%) and at clients of the veterinarians (76% implemented the guideline written in the herd treatment plan of 90-100% of their clients) were high. Finally, 65% of the interviewed practitioners agreed on the fact the cell count cut-off values stated in the guideline are manageable and practicable.

Nevertheless, the survey showed there is still some lack of clarity on the exact aim and way of using the guideline, as well as the frequency of evaluating the drying-off strategy. A large majority (84%) of the respondents has a need for more selection criteria to be included in the guideline dry cow therapy. However, the selection criteria mentioned for integration in the guideline are mainly indicative of prophylactic use of antimicrobials, which makes it is not acceptable to use these in decision making on dry cow therapy. Thereby, veterinarians indicated they evaluated the drying-off procedures with their farmers with very different frequencies (46% schedules evaluation once per year; 20% once every six months and 18% once per quarter). Hence, it is recommended to communicate to the bovine practitioners in the Netherlands what the aim of the guideline is exactly and how the guideline should be interpreted and used to reach that aim. At the same time, there should be communicated the guideline is not designed to be seen as legislation, something that quite a few veterinarians stated to worry about in the given comments.

In addition to this, the interviewed practitioners were interested in information about the effects of selective dry cow therapy in practice. If it is possible to gain this information, it is advisable to use this in the completion of the practical evaluation of the guideline dry cow therapy. Thereby, the information could also be communicated to veterinarians, which could probably lead to positive feelings about involvement in improvement of the guideline.

Taking all results of the survey into consideration, bovine practitioners in the Netherlands are generally pleased with the guideline. Only few results of the survey showed respondents being (slightly) divided on some of the subjects about the content of the guideline. Therefore, it is – in my opinion – not definitely needed to expand reviewing the guideline further at this point in time. Besides this, there is no need for the guideline as a whole to be revised.

Finally, the communication paths used by the KNMvD during the introduction period of the guideline seem to have been effective in order to reach most of the qualified bovine practitioners in the Netherlands. These paths should again be used in the communication on the foregoing uncertainties and point of interest regarding the guideline dry cow therapy to the bovine practitioners in the Netherlands.

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Introduction

Veterinary medicine is always changing; the legislation regarding medicines is becoming more and more strict and there are increasing quality demands of the veterinarian. The veterinarian does not only play a key role in improvement of animal health and welfare, but also in food safety and public health. Decisions weighing the interests of animals, clients, the public and oneself can therefore be difficult to make.

Changing legislation

Since 2009 the first goals on reduction of the amount of antibiotics used in livestock were set by the ministry of Economic affairs of the Netherlands. The main goal was to prevent antibiotic resistance, because it is likely there is a correlation between the use of antimicrobials in veterinary medicine and the development of resistance to antibiotics (Chantziaras et al. 2014). Antimicrobial resistance is, obviously, detrimental for public health (Landers et al. 2012) and thus needs full attention. Following the establishment of a taskforce ‘Antimicrobial resistance in livestock’² in 2008 and the Dutch Veterinary Medicine Authority³ in 2010, transparency in and prudent use of antibiotics became main targets in veterinary medicine (Verburg 2008). Preventive use of antimicrobials – including dry cow antibiotics – was forbidden from January the 1st, 2013. Additionally, antibiotics received the status of ‘administration only by veterinarians (UDD-status)⁴ with stringent conditions for usage in veterinary medicine on the March the first, 2014. Based on the ban of preventive antibiotic use, blanket dry cow therapy – advocated for almost fifty years as part of the 5-point mastitis management program (Neave et al. 1969) – was forbidden.

Selective dry cow therapy and the guideline

According to a study from 2008 (Sampimon et al. 2008) blanket dry cow therapy was used by approximately 87% of the Dutch dairy farmers in 2007, a period during which blanket DCT was fiercely advocated by institutes such as the Dutch Udder Health Centre and veterinary practitioners. A change from blanket to selective dry cow therapy (SDCT)⁵ would therefore be a major step in reducing the use of antimicrobials on dairy farms in the Netherlands. Banning the prophylactic use of antibiotics by application of SDCT could lead to increased incidence of both clinical and subclinical mastitis (Scherpenzeel et al. 2014). Udder health management should be as optimal as possible, because a good udder health status at a farm will lower the percentage of infected quarters (Lam et al. 1996). This will lead to a reduced risk of negative consequences of SDCT.

In January 2014 the guideline ‘Antimicrobial use in dry cow therapy’⁶ was ascertained by the board of the Royal Dutch Society of Veterinary Medicine (KNMvD)⁷. This first veterinary guideline in the Netherlands was written to provide the bovine practitioners in the Netherlands with advice about prescription and use of antimicrobials regarding drying off dairy cows with minimization of preventive use of antimicrobials due to (sub)clinical mastitis (KNMvD 2014). Therefore, the guideline dry cow therapy contains recommendations and tools for optimal udder health management and use of antibiotics for dry cow therapy, which are based on the knowledge of udder health. It contains an explanatory main text about all recommendations and notes which are, as much as possible, underpinned by scientific literature. Thus, together with the legal conditions of antimicrobial use in the Netherlands the guideline dry cow therapy

² Taskforce ‘Antimicrobial resistance in livestock’, shortened to TFABres, in Dutch: Werkgroep ‘Antibioticaresistentie dierhouderij’.

³ Dutch Veterinary Medicine Authority, in Dutch: Stichting Diergeneesmiddelenautoriteit, shortened as SDa.

⁴ Administration only by veterinarians status/regulation, in Dutch: Uitsluitend Door Dierenarts-status/regel, shortened as UDD-status/regel.

⁵ Selective dry cow therapy, shortened to SDCT

⁶ Guideline Antimicrobial use in dry cow therapy, shortened to guideline dry cow therapy.

⁷ Royal Dutch Veterinary Association, in Dutch: Koninklijke Nederlandse Maatschappij voor Diergeneeskunde, shortened as: KNMvD.

forms the current document containing good veterinary practice regarding antibiotic use at drying off of dairy cows in the Netherlands.

With establishing guidelines like this, the government and the KNMvD want to strengthen the position of the veterinarians and provide guidance for making choices on certain (antibiotic) treatments and related advices (van Houten 2013, Kwaliteitsorgaan Diergeneeskunde 2015, Bleker, Schippers 2011). In drawing up the guideline dry cow therapy the professional standard based on literature (evidence based veterinary medicine (EBVM)⁸) and experiences from practice were combined to create a consensus. Writing of the guideline has been executed as described in the procedure for the development of KNMvD guidelines (KNMvD 2013, KNMvD 2014). Two months after publication in November 2013 the guideline was officially approved by the board of the KNMvD.

A study on the attitude of bovine practitioners towards antimicrobial use in dairy cows has been conducted last year (Verduijn 2015). In this study attention has also been paid to SDCT and the related guideline, which has already given some insight in opinions of veterinarians on these subjects. However, because working with veterinary guidelines is new within the veterinary profession, a specific and broader evaluation of the guideline dry cow therapy is important. Besides this, reviewing (medical) guidelines will always be an essential step in promoting and maintaining the quality in health care that veterinarians pursue. Therefore, the KNMvD scheduled an evaluation of the guideline dry cow therapy in 2015, for which a project team⁹ was established.

Aim of the study

This project is the first part of reviewing the guideline dry cow therapy. If results of this project indicate that expanding reviewing of the guideline further is needed for a proper evaluation, more parts of guideline evaluation will follow. These will be executed after this project.

The aim of this study is to quantify the opinion of veterinarians on the guideline, to identify perceived bottlenecks and to propose possible improvements of the guideline. Additional attention has been given to communication, implementation and content and the effects of the guideline. Specific points of interest were:

1. Demographic information: The aim of the questions regarding demographic information was to gain information on the representativeness of the respondents to the survey. Therefore, the bovine practitioners were asked for their year of birth, their year of graduation, the number of veterinarians working in their practice, the number of dairy farms connected to their practice and the number of dayparts working in the dairy industry at the end of the survey.
2. Communication: Aims of questions about communication were to find out in what way veterinarians had heard of the guideline dry cow therapy and if they agreed on the statement of them being quickly and well enough informed about it. Additionally, the ways of communication with farmers about the guideline were identified. Finally, veterinarians were interviewed about their opinions on the structure, the writing, the accessibility, the development and general aim of the guideline.
3. Implementation: One of questions to be answered about the implementation is, if the guideline is used in the farm treatment plans¹⁰ and practice policies with respect to the advice on drying off dairy

⁸ Evidence Based Veterinary Medicine, shortened to EBVM.

⁹ The projectteam consists of two members of the guideline committee of the Farm animal Health Group (GGL) of the KNMvD, a boardmember of the Department of Ruminant Health (VGH) of the GGL and a member of the taskforce for writing the guideline dry cow therapy. The projectteam is supervised by a policy officer from the KNMvD. Execution of the first part of the evaluation was taken charge of by a veterinary student.

Farm animal Health Group, in Dutch Groep Gezondheidszorg Landbouwhuisdieren, shortened to GGL.

Department of Ruminant Health, in Dutch: Vakgroep Gezondheidszorg Herkauwer, shortened to VGH.

¹⁰ Farm treatment plan, in Dutch: Bedrijfsbehandelplan (BBP)

cows? Thereby, aims were to find out if the guideline is used in evaluation of udder health and how frequently evaluation of dry cow management is carried out.

4. **Content:** Questions regarding the content of the guideline were asked to get informed about the practical applicability of the guideline and the most involved criteria in decision making about dry cow therapy. Besides this, aims were to find out if there were more selection criteria required in the guideline and if the cell count cut-off values as specified in the guideline are usable in practice?
5. **Effects:** Other aims of the study were to get informed about possible changes in incidence of mastitis and culling due to mastitis. At last there was attention for the question about how veterinarians think about themselves and their advice on selective dry cow therapy.

Materials and Methods

Study design

An online survey was selected for execution of the project enabling all qualified bovine practitioners¹¹ to give their opinion about the guideline dry cow therapy. There was chosen to use an online survey, as web-based questionnaires are relatively inexpensive and easy to design (Dillman 2000).

Questionnaire

The questionnaire was discussed with the project team and pre-tested by some of them. It contained 41 questions, which were open ended questions, multiple choice, as well as Likert scale questions (see Appendix I). Main topics in the questionnaire were communication, implementation, the content and the effects of the guideline. Demographic information was collected in the last eight questions, but will be discussed first in the results and discussion.

The online questionnaire was available on Survey Monkey (online survey-program) from the 1st of December 2015 until the 27th of December 2015. The first invitation for filling in the questionnaire was sent on the 1st of December 2015. Two reminders were sent (11th and 21st of December 2015). The questionnaire was also promoted in the newsletter of the Department of Ruminant Health (VGH)¹² of the KNMvD.

Inclusion criteria

All bovine practitioners were given the opportunity to give their opinion on the guideline dry cow therapy. Therefore, the public list of ‘qualified bovine practitioners’ was used as recipient list for the online survey. This list contained 888 veterinarians, of whom 115 dropped out as their personal data (e-mail addresses) were protected and 4 dropped out due to several other reasons. Additionally, there were 14 failing e-mail addresses, 31 bovine practitioners who disallowed Survey Monkey to deliver any invitation for a questionnaire and 2 veterinarians weren’t practitioners anymore. Therefore, an invitation for the online survey was sent and delivered to 722 bovine practitioners in the Netherlands.

Analysis

Before the analysis of the data could start, data of some questions were reorganized. Some numerical questions, for example, had a wide range of answers. Therefore, the responses to these questions were placed into groups. Besides this, questions were sometimes not taken seriously or answers were not applicable to a question. These opinions, responses and answers to a question were not included in the (statistical) analysis. Therefore, the number of answers included in the analysis of a question is specified in percentage of the total number of respondents using (N=..%) in the results.

Spread through the survey, especially after Likert scale questions, there were opportunities for the respondents to give explanations of or comments about the given answer(s). All comments made throughout the whole survey are read and categorized in explanatory, positive, negative and neutral comments.

Data from most of the survey questions are data on ordinal scales (Clason, Dormody 1994). Therefore, descriptive statistics (using the programs Microsoft Excel and IBM SPSS Statistics) has been used for analysis of the survey. The mean and standard deviation aren’t useful parameters for this, as a normal distribution is not applicable to the ordinal data (Allen et al. 2007). Therefore, non-parametric procedures as determining the median and mode were used to describe most of the results. Besides this, frequencies and interquartile ranges were calculated and tabulations and bar charts – with breakdown percentages per question for describing the variability of the responses – were also made. Furthermore, a few numeric questions were analysed with descriptive statistics including determination of the mean, standard

¹¹ Qualified bovine practitioner, in Dutch: Geborgde rundveedierenarts

¹² Department of Ruminant Health, in Dutch: Vakgroep Gezondheidszorg Herkauwer, shortened to VGH.

deviation and/or 95% Confidence intervals (95%-CI)¹³. For this purpose both IBM SPSS Statistics as well as Microsoft Excel were used.

¹³ 95% Confidence interval, shortened to 95%-CI.

Results

At the end of the period in which the survey was open 180 responses to the questionnaire were received. This corresponds to 24,9% of the 722 reached bovine practitioners. From the 180 bovine practitioners who filled in the survey not all answered all questions and not all given answers were included in the analysis of a certain question. Therefore, the percentage of the total number of respondents (180) whose answers to the question are included in the analysis is stated using (N=..%).

Part I – Demographic information

Personal information

Looking at the gender frequency, more men (72%) than women (28%) filled in the survey (N=89%). This exactly corresponds with the male/female distribution of the list of bovine practitioners who were to receive an invitation for the survey (n=773; 72% male/28% female) (Appendix B, Table 1).

The mean year of birth of all respondents was 1971, which gives a mean age of 44 in 2015. Comparing the gender and year of birth, the male bovine practitioners were significantly older (mean: 1970) than the females (mean: 1976) (Appendix B, Table 2). Most of the respondents were between 30 and 40 years old, followed by veterinarians aged from 50-60 years and 40-50 years (Figure 1). The mean year of graduation of the respondents is 1999 (16 years before 2015), with a mean of 1997 of the male and 2003 of the female respondents (N=91%; Appendix B, Table 3). Most respondents graduated 1-10 years ago, followed by an almost equal group of veterinarians which graduated 10-20 years ago (Figure 2).

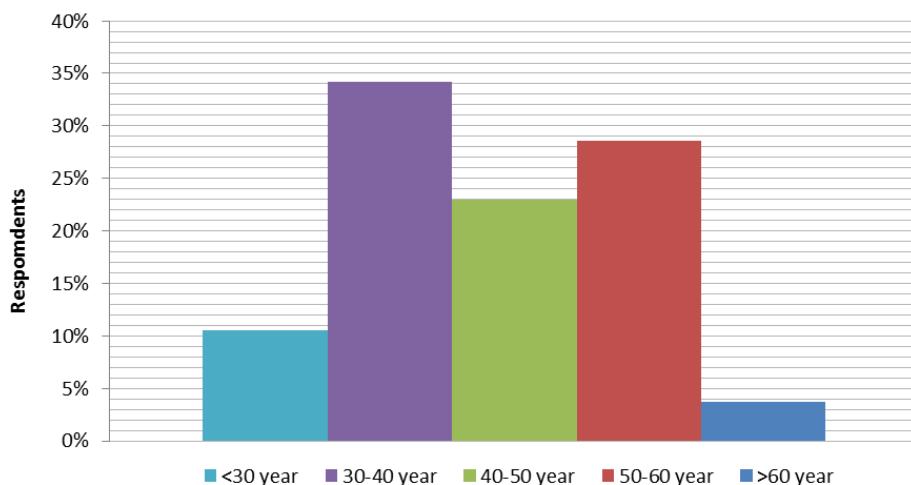


Figure 1 Distribution of the age of the respondents (N=89%)

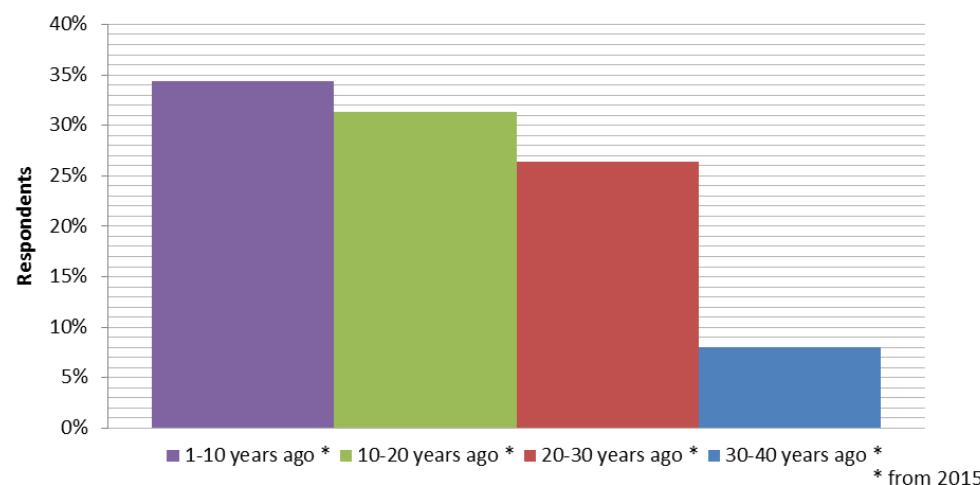


Figure 2 Distribution of the graduation of the respondents (N=91%)

Practice-related information

On average 4,5 veterinarians were working in the practices of the respondents, but there was a relatively large range within the answers (95%-CI $\pm 0,3$) (Figure 3).

The mean number of the dayparts¹⁴ practitioners are working in the dairy industry per week is 7,5 with a broad distribution (Appendix B, Figure 1) and a 95%-CI of $\pm 0,40$ (N=88%). Besides this, the number of farms related to a practice was on average 118 (95%-CI ± 11) (Figure 4).

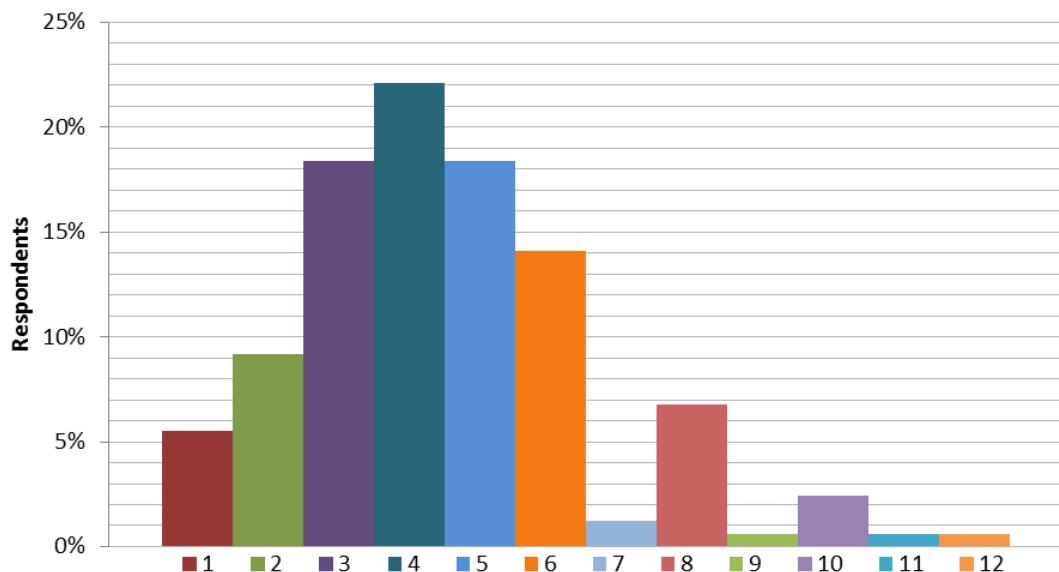


Figure 3 Percentage of numbers of veterinarians per practice (N=91%)

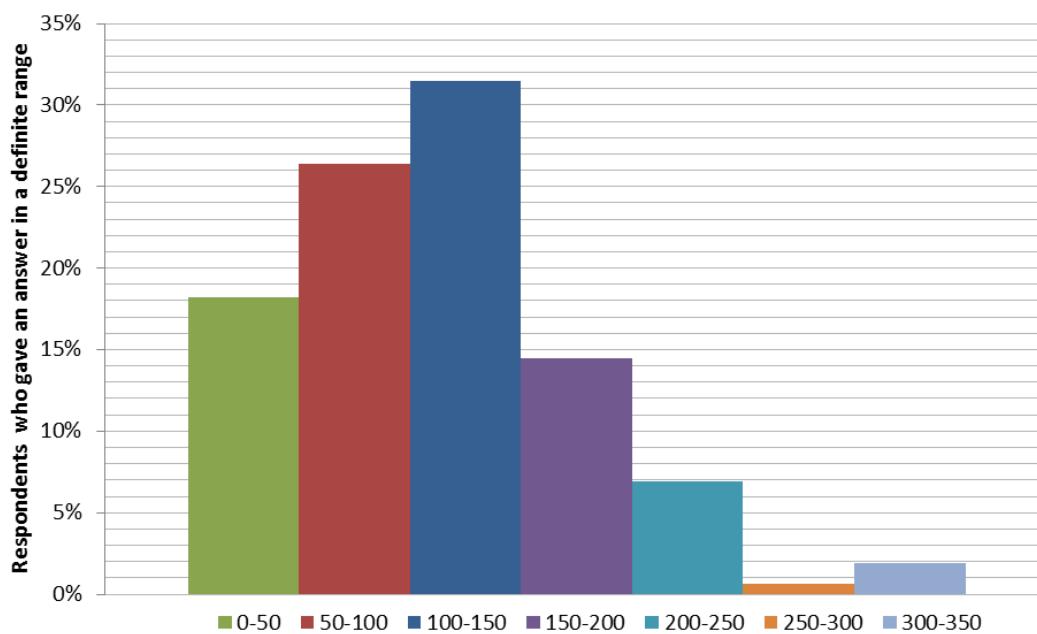


Figure 4 Distribution of dairy farms connected to practices of respondents (N=88%)

¹⁴ Daypart: One daypart is half of a day (morning or afternoon).

Part II – Communication

Informed about the guideline and access to it

Slightly more than half (58%) of the questioned veterinarians (N=100%) were informed about the guideline dry cow therapy by an e-mail update from the KNMvD. Between 35% and 40% of the respondents took notice of the guideline by consultation between colleagues, the newsletter of the KNMvD, the informative letter of the VGH and the announcement in the Dutch Journal of Veterinary Medicine¹⁵ (Appendix B, Figure 2).

A majority (68%) agreed (42%) or partly agreed (26%) with the statement that they were informed quick and well enough about the guideline (Median¹⁶ (MDN)=2; Interquartile range¹⁷ (IQR)=2) (Figure 5, (statement) nr. 1 and Appendix B, Table 5). Only a small minority (5%; MDN=1; IQR=1) (partially) felt the guideline wasn't and still isn't easy to find (Figure 5, nr. 2 and Appendix B, Table 5).

The majority of the interviewed veterinarians (N=100%) stated that they did not look at the content of the guideline dry cow therapy very often in 2015. Most of the respondents to this question studied the guideline once, whereafter they integrated it in the dry-off procedure which they advise their farmers to use (64%). Others accessed the guideline once every six months (12%), once per month (7%) or once per year (5%).

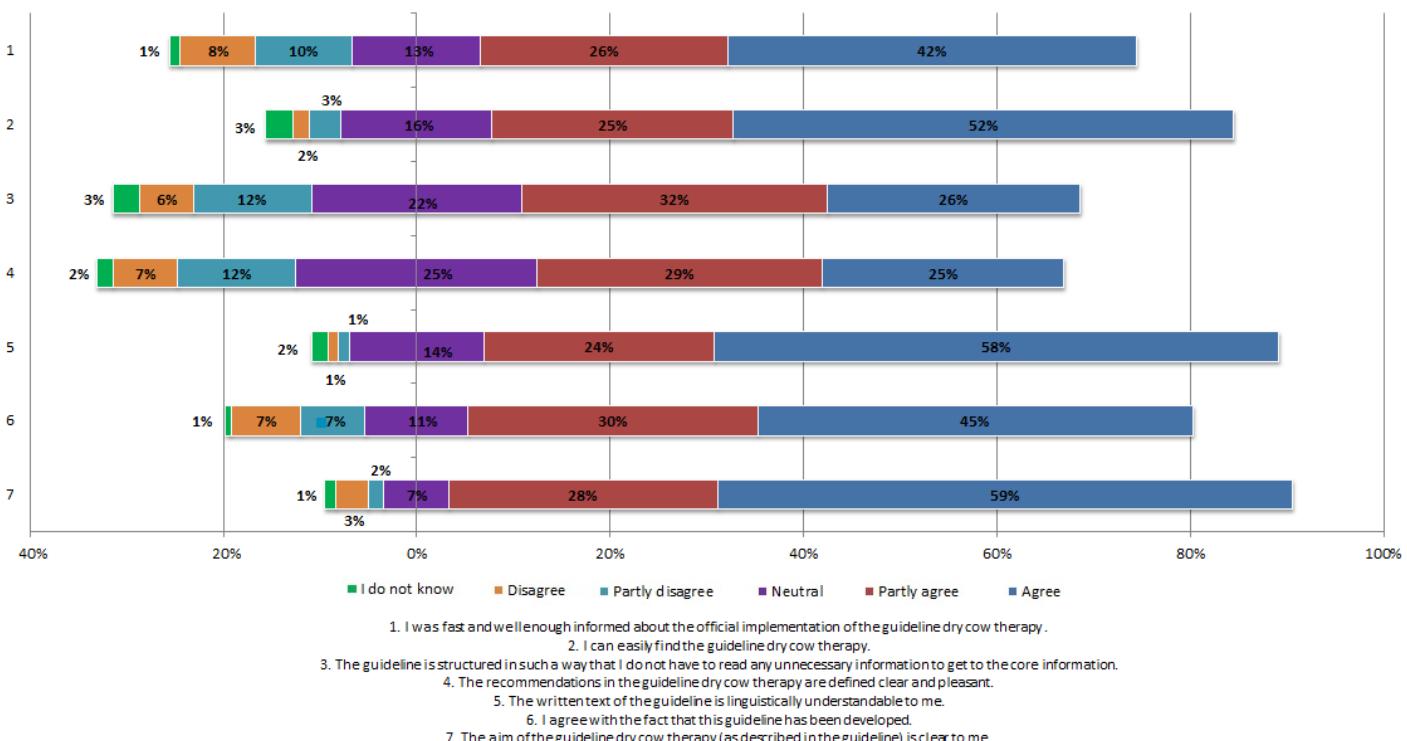


Figure 5 The opinion of bovine practitioners (N=100%) on various statements regarding communication about the guideline

Structure and writing of the guideline dry cow therapy

A slight majority (58%) has responded positively to the propositions regarding the structure and getting to the core information of the guideline dry cow therapy, while 22% had a neutral view on this (Figure 5, nr. 3). On clarity of definitions of the recommendations in the guideline 25% agreed and 29% partly agreed. In addition to that, 25% had a neutral opinion to this statement (Figure 5, nr. 4).

¹⁵ Tijdschrift voor Diergeneeskunde, shortened to Tvd; Eng. Dutch Journal of Veterinary Medicine

¹⁶ Median, shortened to MDN

¹⁷ Interquartile range, shortened to IQR

Although the answers given on statement nr. 3 and 4 are generally positive, they are more widespread than the answers on the statements about being quickly and well enough informed about the guideline (Figure 5, nr. 1) and being able to quickly find the guideline (Figure 5, nr. 2 and Appendix B, Table 5). The written text of the guideline is understandable to 82% of the respondent bovine practitioners (58% agreed, 23% partly agreed; Figure 5, nr. 5 and Appendix B, Table 5).

Practitioners agreed (partly agreement – 30%; total agreement – 45%) that it's good the guideline dry cow therapy has been developed (75%; MDN=2, IQR=1) (Figure 5, nr. 6 and Appendix B, Table 5). On clarity on the aim of the guideline dry cow therapy veterinarians scored 87% (partial) agreement (MDN=1, IQR=1) (Figure 5, nr. 7 and Appendix B, Table 5).

Informing farmers about the guideline dry cow therapy

The majority of the interviewed veterinarians informed their clients about the guideline dry cow therapy by oral explanation, either by telephone or when visiting/visited by the client (83%) (Figure 6). In addition to that, written explanations specific for each dairy farm (38%), written explanations by a general brochure or informative letter from the practice (37%), practice meetings for farmers (33%) and enclosing flowcharts from the guideline in the farm treatment plan of clients (30%) were used often (Figure 6).

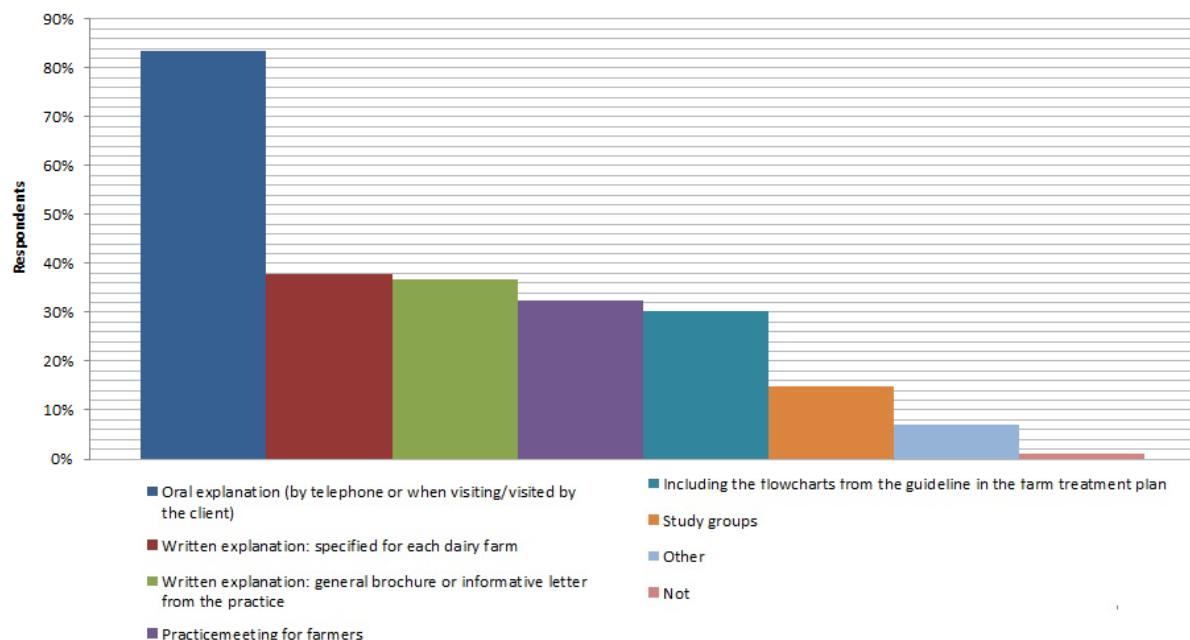


Figure 6 Distribution of the used ways of communication about the guideline dry cow therapy towards dairy farmers (N=99%)

Comments of respondents on communication of the guideline

A subject that was repeatedly referred to in the 57 comments on questions regarding communication was the lack of clarity about the date of implementation of the guideline and the short time between the first communication about the guideline and implementation of it (stated in 11% of the comments). Besides this, the respondents frequently mentioned they felt they nearly had to take the complete responsibility of informing farmers about antibiotic resistance, SDCT and the guideline (stated in 9% of the individual comments).

Part III – Implementation

Use of the guideline dry cow therapy

On the question what the policy regarding advice on drying off dairy cows of the veterinary practice they work in is, a large majority – 78% – of the interviewed veterinarians chose for the answer option ‘We have one procedure on drying off, based on the guideline dry cow therapy, that we all use in our practice.’ (Table 1).

Table 1 Answers to the question on ‘Policy regarding advise on dry cow therapy in Dutch practices’ (N=91%)

What is the policy of the veterinary practice you are working in, with respect to the advice on drying off dairy cows?	Percentage (%)	Response count (N)
We have one procedure on drying off, based on the guideline dry cow therapy, that we all use in our practice.	78%	127
We have one procedure on drying off, which differs from the guideline dry cow therapy, that we all use in our practice.	7%	12
Each practitioner within our practice determines his or her own advice and bears personal responsibility for this.	10%	17
I work by myself, my own policy regarding dry cow therapy is the practical procedure.	4% + 100%	7 + 163

A majority (92%) of the questioned farmers did use the guideline dry cow therapy when drafting the herd health plan (BGP)¹⁸ for their farmers (N=98% and Appendix B, Figure 3). However, this large group has to be divided in two: 52% answered ‘Yes, but the BGP differs from the guideline recommendations if there is – in my opinion – reason to do so’, while 40% uses the selection criteria as specified in the guideline when drafting the BGP for his/her clients.

Furthermore, 76% of the bovine practitioners implemented the guideline dry cow therapy written in the herd treatment plan (BBP)¹⁹ of 90-100% of their dairy farmers (Figure 7). Another 8% and 7% implemented the guideline in the BBP of respectively 80-90% and 70-80% of their clients.

¹⁸ Herd health plan, in Dutch: Bedrijfsgezondheidsplan (BGP)

¹⁹ Herd treatment plan, in Dutch: Bedrijfsbehandelplan (BBP)

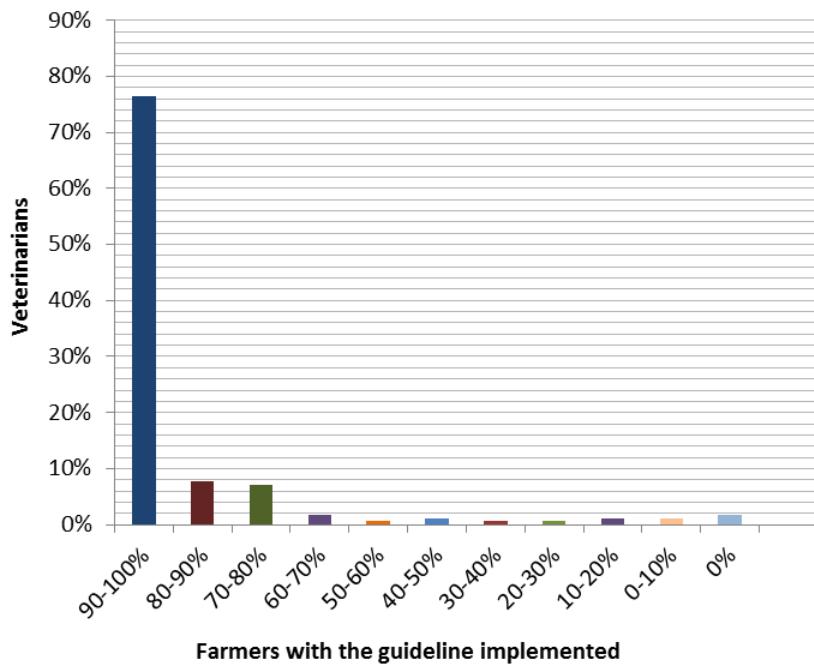


Figure 7 Implementation of the guideline dry cow therapy by veterinarians at their farmers (N=98%)

Evaluation of the implementation of the guideline dry cow therapy

Almost half of the respondents (46%; 95%-CI ±5%) indicated they evaluated the drying-off procedures with their clients with a frequency of once per year (Figure 8). There is also a significant percentage of clients where the dry-off procedure is evaluated once every six months (20%; 95%-CI ± 3%) and once per quarter (18%; 95%-CI ± 4%).

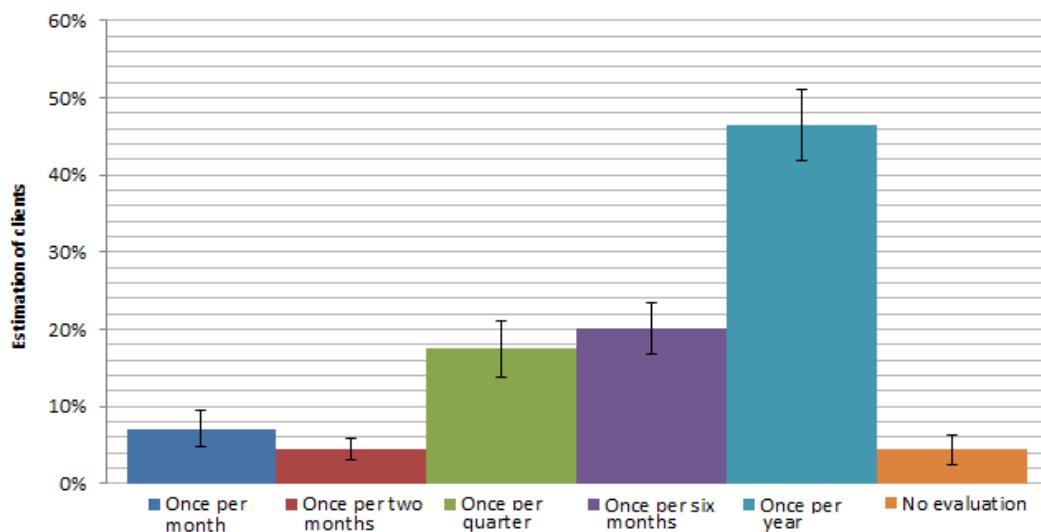


Figure 8 Estimation (by practitioners) of percentages of clients with whom drying-off is evaluated at specific frequencies (N=91%)

A majority (70%) of the interviewed practitioners (N=94%) uses the guideline dry cow therapy when evaluating the drying off strategy on their clients' farms. Another 16% has given their own interpretation to the evaluation of drying off strategies at farms, while 10% and 4% respectively hardly ever and never use the guideline for this purpose.

Subjects focused on most when evaluating udder health management (with specific attention to the dry cow period) are the use of teat sealants (90%), medication use (81%), milk production at dry-off (<12kg) (85%), grids and bedding material (80%), hygiene of the calving pen (80%), diagnostics (74%) and teat disinfection as part of the milking routine (69%) (N=91%) (Appendix B, Figure 4). Less attention is given to verification (of the goals), cubicles for lying down, milking after calving, hooftrimming, teats and condition score of dry cows and prevention of flies.

Comments of respondents on implementation of the guideline

A subject that was repeatedly referred to in the 56 comments on the implementation of the guideline was the fact that practitioners would like to see the guideline being developed more or less in a way it can be used more specific per farm (stated in 14% of the comments), leading to differences in the dry cow management strategies between farms. Besides this, involving more selection criteria in decision making on dry cow therapy was also frequently mentioned (stated in 11% of the comments). Additionally, there was also stated twice there still are farmers who don't administer antibiotics based on the principle of SDCT. These practitioners feel like this has no direct consequences for the farmers, while they feel the only thing they can do about it, is talk with the farmers and try to make them aware of the risks and legislation.

Part IV – Content

Opinions on statements about the content of the guideline dry cow therapy

On the applicability of the recommendations in the guideline dry cow therapy in practice 66% of the survey respondents scored partial (44%) or total agreement (21%; MDN = 2; IQR = 1) (Figure 9, nr. 1 and Appendix B, Table 7). In addition to these positive answers, 23% (partly – 14%) disagreed with this statement. The practitioners answered the statement on the practical usefulness of the flowcharts in the recommendations from the guideline generally positive or neutral (agreement – 31%; partial agreement – 28%; neutral – 28% with MDN=2; IQR=2 (Figure 9, nr. 2 and Appendix B, Table 7)).

More veterinarians (31%) did not agree with the statement "I am satisfied with the scientific literature ("endnotes") underpinning the content of the guideline dry cow therapy", than veterinarians agreed with the statement (27 %; MDN=3; IQR=2 (Figure 9, nr. 3 and Appendix B, Table 7)). A large majority of bovine practitioners is in agreement (partial agreement – 10%; total agreement – 64%; MDN=1; IQR=1) with a need for including more selection criteria used for SDCT in the guideline, than the selection criteria that are now stated in the guideline (Figure 9, nr. 4 and Appendix B, Table 7). Besides this, 20% of the respondents had a neutral opinion on this statement.

Approximately 41% of the respondents indicated their opinion on the guideline dry cow therapy became more positive, while 30% answered with a neutral opinion on this statement (MDN=3; IQR=2 (Figure 9, nr. 5 and Appendix B, Table 7)).

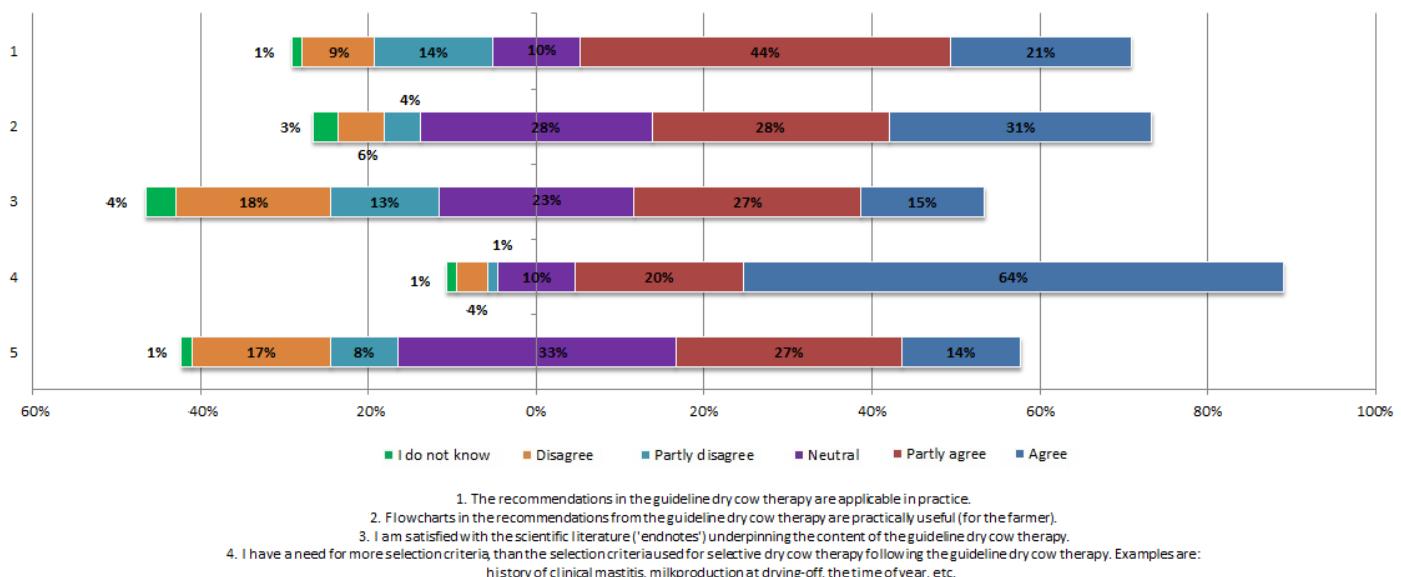


Figure 9 The opinion of bovine practitioners (N=94%) on various statements regarding (content of) the guideline

Selection criteria

On the question if the practitioners advise farmers to use diagnostics on cow- or quarter-level for decision making about dry cow therapy almost two-third (65%) of the respondents (N=89%) answered they advised all their farmers to make decisions based on diagnostics on cow-level. One-third (33%) answered they advise most of their farmers to use diagnostics on cow-level, while the remaining 2% of respondents answered they (mainly) advise to use diagnostics on quarter level.

For the two questions about the selection criteria that veterinarians think are most important in their advice to farmers five answers were selected the most (Figure 10). The five most selected answers were (listed in order of frequency):

1. Somatic cell count of the last MPR before drying off (respectively 88% and 66%)
2. History of clinical mastitis during the last lactation (respectively 80% and 59%)
3. Somatic cell count during the entire previous lactation (respectively 70% and 58%)
4. Milk production at dry-off (respectively 56% and 43%)
5. Bacteriological testing of the individual cow/heifer (respectively 49% and 23%).

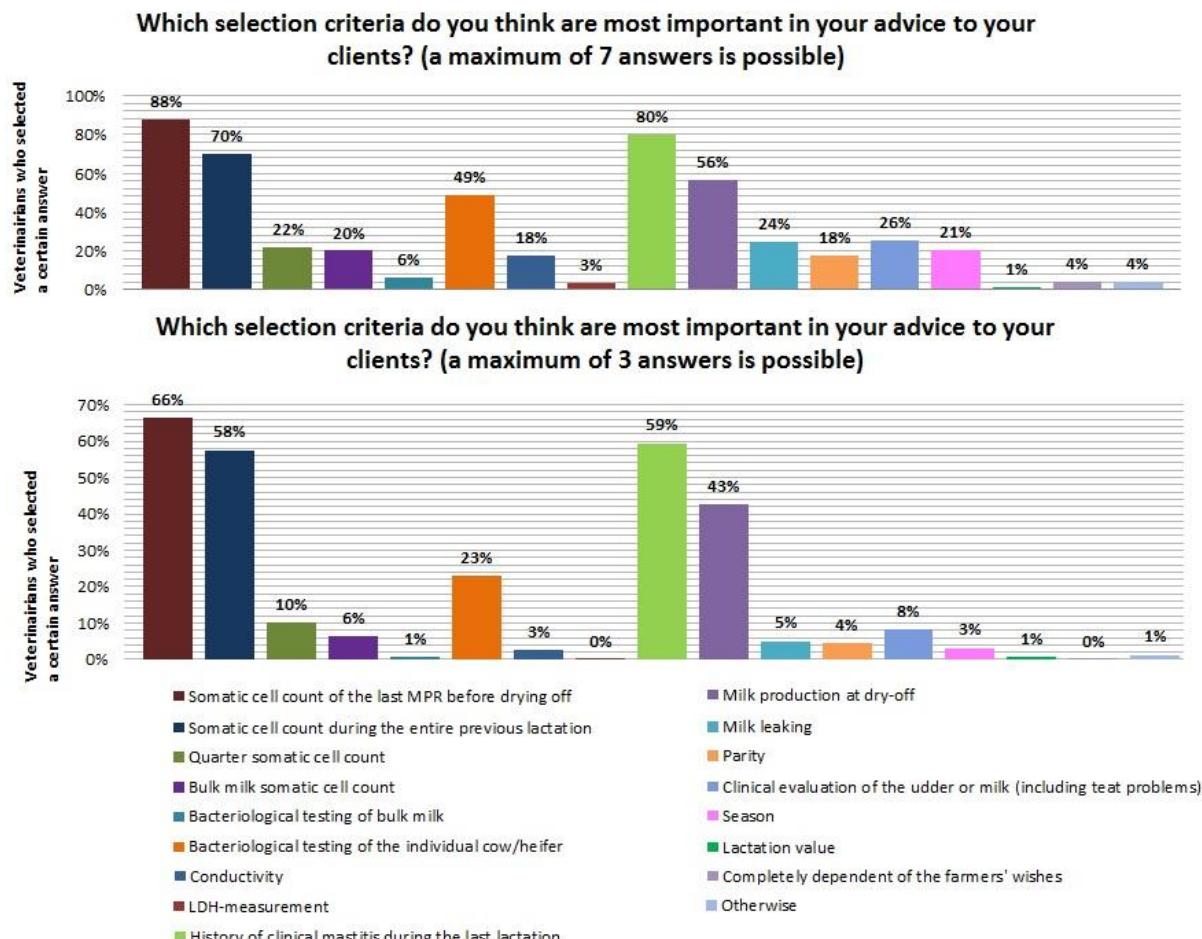


Figure 10 Percentage of veterinarians who selected certain answers to the questions above the bar charts (N=89%)

For the following two questions about which selection criteria practitioners think are most used by their farmers four answers – which were also in the top five advised criteria by veterinarians (Figure 10) – were by far selected most often (Figure 11). The four most selected answers were (listed in order of frequency):

1. Somatic cell count of the last MPR before drying off (respectively: 88% and 83%)
2. History of clinical mastitis during the last lactation (respectively: 72% and 50%)
3. Milk production at dry-off (respectively: 71% and 46%)
4. Somatic cell count during the entire previous lactation (respectively 57% and 39%).

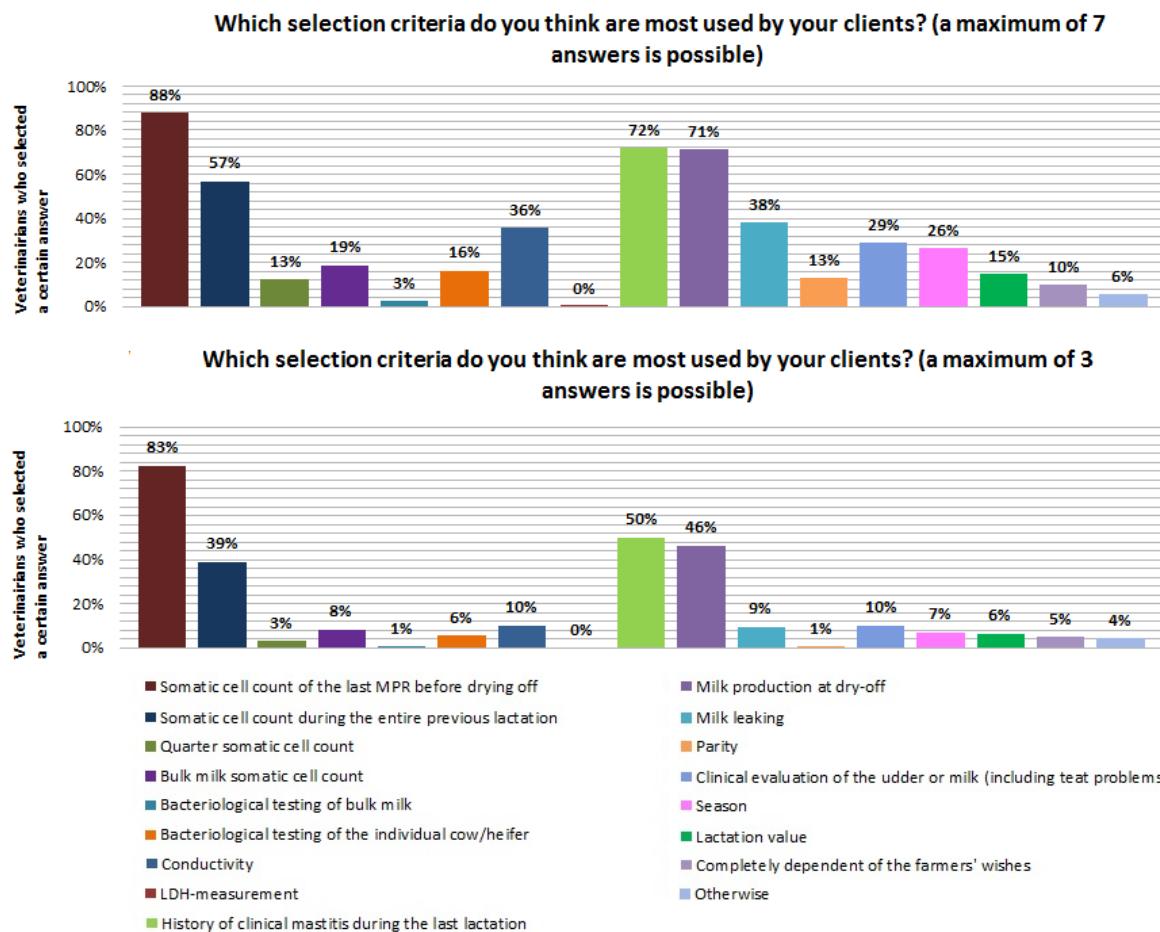


Figure 11 Percentage of veterinarians who selected certain answers to the questions above the bar charts (N=89%)

It is possible farmers do not use the MPR as (only) selection criterion. On the question if veterinarians think their clients report the other used diagnostics and related results (N=88%), the answer 'The farmer does not write down the used diagnostics and results' was most chosen by bovine practitioners' (39%). The next most chosen answer was 'The farmer writes down the used diagnostics and results of the cows dried off with antibiotics in the farm administration' (20%). The remaining percentage of respondents almost equally divided their answers on the other three answer options: 'The farmer writes down the used diagnostics and results of each cow in the farm administration', 'The farmer does not write down the used diagnostics and results as the diagnostic procedures are described in the farm treatment plan' and 'This question does not apply to my clients as they all only use the MPR for this purpose'.

On the question (N=88%) about which criteria should (according to the practitioners) be used for selection of cows (and heifers) for treatment with antimicrobials at drying off, almost 29% answered they would like to see the cell count criteria specified in the guideline be used. Another 29% would like to see the criteria specified in the guideline be used with newly defined cell count cut-off values (Appendix B, Figure 5). Most respondents (32%) chose the answer option 'otherwise'. Repeatedly mentioned comments given at the answer option otherwise were: (Clinical) mastitis history and the (MPR results of the) whole lactation (57% corresponding to 29 times mentioned), multifactorial & risk-analysis (25%) and milk production/milk yield at drying off (18%) (Appendix B, Figure 6).

Cell count cut-off values

The answers (N=88%) to the first question about the cell count cut-off values – please indicate to what extent you agree with the following statement: “Cut-off values of the SCC for heifers (150.000) and cows (50.000) are manageable and practicable” – showed almost 45% is fine with using the cell count cut-off values stated in the guideline. Another 20% was also in agreement with the statement, however, the respondents who chose this answer didn't know what these values were based on. Almost 35% did not agree with the statement and either would like to see equal values for cows and heifers (22%), or totally different values (13%).

The second question resulted in confidence intervals of cell count cut-off values of 74.420 ± 8.090 and 66812 ± 7127 for respectively heifers and cows (Appendix B, Table 8). This indicates a relatively wide range in the given answers, which can also be seen in Figure 12. The median and mode for both heifers and cows is 50.000. Thereby, the most given answer-combination was 50.000 for both heifers and cows (39% of the respondents, n=27) (Figure 12). The answer combination 50.000 for cows and 100.000 for heifers was also frequently given (14%), as well as the combination 100.000 for both cows and heifers (12%).

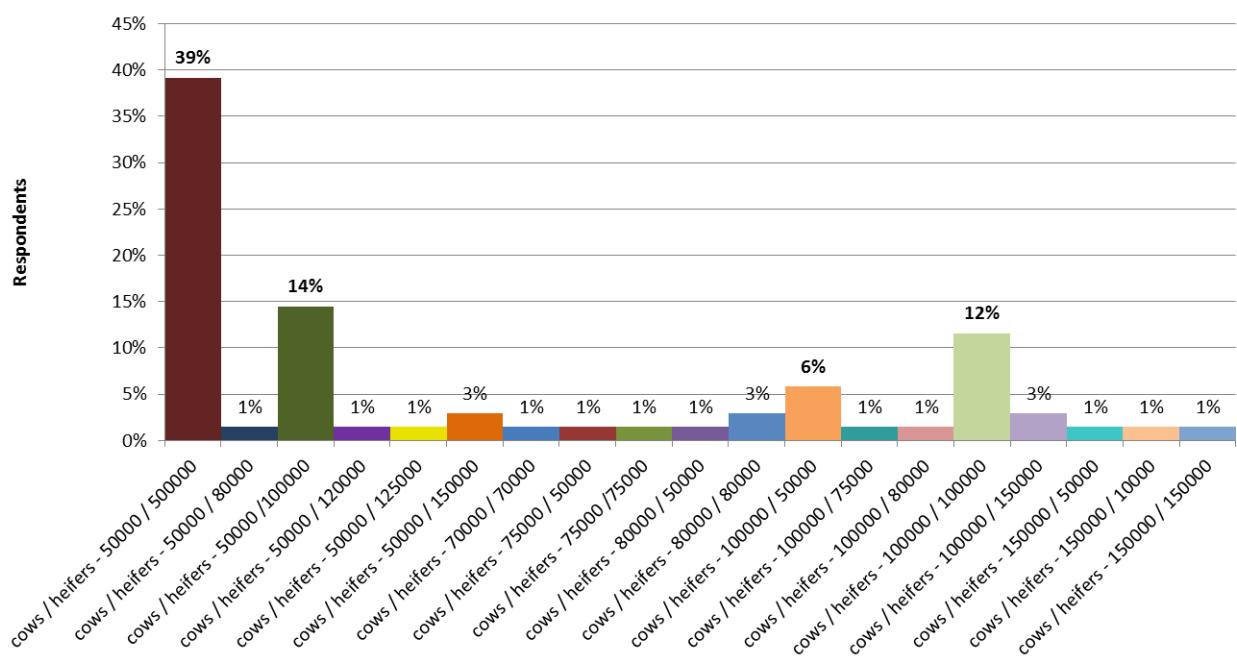


Figure 12 Practicable combinations of cell count cut-off values for heifers and cows according to practitioners (N=38%)

Udder health management

To the question if veterinarians advise their farmers to use internal teat sealants as part of the dry cow therapy strategy 59% of the respondents (N=88%) answered yes, while 37% answered it differs from farm to farm, but in general they advise to use them. The remaining 4% of the respondents answered it also differs from farm to farm, but in general they do not advise to use teat sealants. On the question for which cows teat sealants should be used – with the possibility to choose multiple answers – a majority (67%) answered ‘all cows that are dried off’ (Appendix B, Figure 7). Thereby 41% answered ‘low SCC cows dried off without using antibiotics’ and 28% answered ‘high SCC cows, whereby teat sealants are combined with antibiotics’.

Part V – Effects of selective dry cow therapy

For questions on the effects of SDCT on the incidence rate of mastitis and culling due to mastitis (N=88%) almost half of the veterinarians, respectively 50% and 49%, chose the answer that the rate had slightly increased since the guideline dry cow therapy was introduced (Appendix B, Figure 8 and 9). Thereby, approximately one third of the respondents answered to both questions the rates had stayed approximately the same since the introduction.

Most of the questioned veterinarians answered in agreement (partial agreement 42%; agreement 30%) on the final statement "I am on the right track with giving advice on selective dry cow therapy" as can be seen in Figure 13.

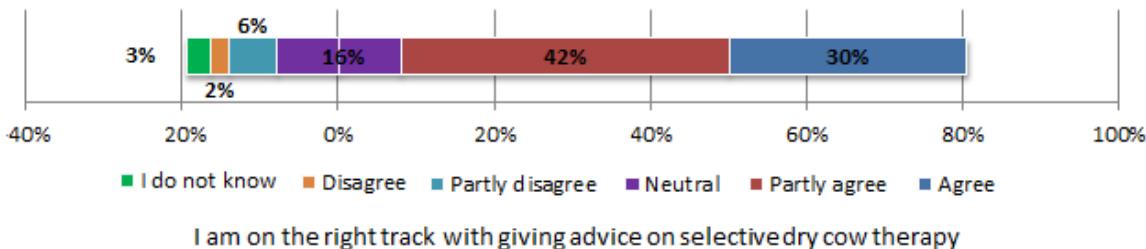


Figure 13 The opinion of bovine practitioners on the statement: "I am on the right track with giving advice on selective dry cow therapy" (N=91%)

Comments of respondents on content (and the effects) of the guideline dry cow therapy

In total 76 individual comments on the content of the guideline were given, while in total 42 comments were given after the last statement ("I am on the right track with giving advice on selective dry cow therapy"). Most comments on the last statement are explanations and self-reflections of practitioners on advising SDCT, which differ from comments such as "It's hard to judge myself, but I am certainly trying my best in advising farmers about selective dry cow therapy" to "I do not support what I actually should advise farmers about dry cow therapy according to the guideline". The main subjects of the comments given on the content of the guideline were:

- The – in the opinion of veterinarians – poor scientific basis of the guideline (; mainly of the cell count cut-off values currently stated in the guideline dry cow therapy) – stated in 15% of the comments on the content of the guideline.
- The reduced freedom of using certain criteria for making decisions on dry cow therapy and the fact that many bovine practitioners would like to see more criteria be involved in the content of the guideline dry cow therapy – stated in 20% of the comments on the content of the guideline.
- The – in the opinion of veterinarians – deterioration of animal welfare, as the incidence of (chronical/clinical) mastitis and culling due to mastitis seem to increase – stated in 12% of the comments on the content of the guideline.

Discussion and conclusion

Working with guidelines is new within the veterinary profession. A thorough evaluation of (medical) guidelines is important, as this is an essential step in promoting and maintaining the quality of health care which veterinarians pursue (van Everdingen 2013). Besides this, the guideline has a central position in the regulation of antimicrobial use in Dutch dairy cows, because it gives substance to practical implementation of legislation on – in this case – antimicrobial use, which is the same for diverse guidelines in human medicine (Bleker, Schippers 2011).

Study design

The aim of reviewing the guideline dry cow therapy was to quantify the use of the guideline by bovine practitioners, to ask them for their opinion on the guideline and to identify bottlenecks and possible improvements. Specific attention has been given to communication, implementation, content and the effects of the guideline.

A major part of this study focused on quantitative aspects of using the guideline, for which questionnaires, prospective registration and analysis of existing records would have been possible review methods (van Everdingen 2013). Eventually, the online survey appeared to match best with the purpose of the study. Besides this, web surveys are easy to design, are inexpensive and have a great reach. It's easy to send reminders for web surveys and data or online surveys can be easily imported in data analysis programs (Dillman 2000, Archer 2003). However, when having a closer look at the results of a survey, one should always keep in mind social desirable answers are given by respondents to questions regarding themselves. Besides this, it is possible extreme answers are chosen more easily, compared with the answers that would have been obtained by observational studies or a telephone survey (van Everdingen 2013). As observational studies and telephone surveys are costly and time consuming, questionnaires are still often used (bearing in mind the possible deviations from reality), as was also the case for this project.

In addition to the questionnaire, it was considered to study the quantitative aspects in more detail, supplemented with studying qualitative aspects of guideline use. To do so, an expert session with content based on the outcome of the survey could have been carried out. However, due to the time limitation of the research project the expert session could not be executed. Nevertheless an advice for the most useful format of an expert session was written (in Dutch) (see Appendix C).

If the project team should decide to expand reviewing the guideline further – which is in my opinion not definitely needed, as the overall opinions on different aspects of the guideline (implementation) seem to be positive – the expert session should be carried out. This session could contain questions based on the results of the survey. It will create the opportunity for a representative group of practitioners and diverse experts to give their opinion on bottlenecks and possible improvements of the guideline.

Response

The online questionnaire was spread to the qualified bovine practitioners in the Netherlands, as it is important to hear the opinion of all the veterinarians in the field. However, not all bovine practitioners involved in using the guideline were approached, as contact information from a limited number of them was missing. Although the response rate of a slightly shorter, but comparable survey (Verduijn 2015) was higher with 31,9% of 648 practitioners, an acceptable total of 22,0% of the 722 reached bovine practitioners completely filled in the questionnaire. It is possible the response rate could have been increased a bit if some things would have been done different.

With a number of 41 questions the survey was relatively long, which could have affected the final response rate adversely (Yammarino et al. 1991). Additionally, there hasn't been any precontact with the practitioners about a forthcoming survey, which could also possibly have increased the response rate (Cook et al. 2000). The number of responses could also have been affected positively when a telephone survey had been conducted. However, the factor time was a too severe limitation for this and the reach of a web-based questionnaire is much greater than of a telephone survey.

It is never certain the participating veterinarians are completely representative for all bovine practitioners, because one can have more motivation to give their opinion on this subject than another. On the other hand, the man/female distribution (72%/28%) of the list of qualified bovine practitioners corresponded exactly with the gender frequency of respondents to the survey (28% female/72%male). Additionally, the demographic information shows that diverse ages, ranges of years of graduation, numbers of practitioners and dairy farms per practice are represented by the respondents to the survey.

Survey results

Communication

Generally, the veterinarians have responded positively to the questions and statements on communication and clarity of the guideline dry cow therapy. Most of them have been informed about the guideline by the communication paths from the KNMvD, which is a good sign, because this indicates these paths to inform veterinarians are effective.

Most respondents (63,7%, n=114/179) accessed the guideline only once, after which they integrated it in the dry-off procedures they advise their farmers to use. This approach to the guideline can be favourable, as veterinarians really read and spent time on the guideline. However, one might ask if all the information will be remembered correctly after reading the guideline only once. This can have been of influence on the answers given to survey questions regarding the content of the guideline. As an example, one might ask how reliable the opinions on the statement about the scientific literature ('endnotes') underpinning the guideline are, if veterinarians have only read through these endnotes once. It is because of this, the opinions on the statement "I am satisfied with the scientific literature underpinning the content of the guideline dry cow therapy" are not completely reliable. Besides this, the opinions on the statement are broadly distributed. Therefore, the scientific endnotes should not be modified at this point in time, as there is no reliable reason to do so. However, if there is new scientific literature available, which is also applicable to the content of the guideline, this should be included in the guideline (regardless of the amount of changes that have to be made in the content) as soon as possible.

Although the general view on the communication on the guideline is positive, quite a few comments as an explanation to the given opinions were made. One frequently given comment was that veterinarians felt they nearly had to take complete responsibility of informing farmers about SDCT and the guideline. Although veterinarians are important 'factors' in communication with farmers (Lam et al. 2011), information can be more easily and efficiently transmitted to farmers by cooperation with stakeholders of the (dairy) industry (Jansen, Lam 2012). Therefore, information about the guideline could in the future be more easily transmitted to farmers in cooperation with stakeholders – such as the dairy industry, government and farm journals – if this way of communication hasn't been included in the communicational strategy on the guideline before.

Implementation and evaluation

The percentages of implementation of the guideline at clients of the veterinarians were relatively high. Thereby, the answers indicate progression over almost a year, when compared with the answers given by practitioners to a comparable question in a study from the beginning of 2015 (Verduijn 2015). An explanation for this progress in the implementation percentage might be the fact that when the survey of this research project was conducted, more time since the introduction of the guideline dry cow therapy had expired. In this period more farmers can have been visited and maybe convinced by veterinarians to change their strategy for dry cow therapy fully to SDCT.

Veterinarians indicated they evaluated the drying-off procedures with their farmers with different frequencies. It is possible the difference in the evaluation frequency per farmer per veterinarian is caused by the differences in the farmers request for evaluation of the dry cow therapy. The differences in the standard evaluation frequency between respondents may also be explained by a slight confusion caused

by the description of the advised and mandatory evaluation frequencies in the guideline dry cow therapy, guideline ‘Application of antibiotics’ (guideline TAM)²⁰ and the UDD-regulation.

Following the guideline dry cow therapy the drying-off strategy (selection and treatment of cows plus dry cow management) at a farm has to be evaluated at least once a year. Thereby, it is advised to schedule evaluation of dry cow management four times per year (and evaluate it when necessary) (KNMvD 2014). The guideline TAM states all treatments with antimicrobial agents – including therapy evaluation – have to be discussed and written down during the regular scheduled visits of practitioners to the farmers (KNMvD 2015). The frequency of these visits should at least be the same as the frequency in the UDD-regulation. This tells us that visits by a veterinarian should at least take place once per three months. However, if the farmer takes part in a quality chain system²¹, the evaluation frequency should only be at least once every six months (Ministerie van Economische Zaken 2014). Hence, when combining the guidelines dry cow therapy and TAM, the drying-off strategy should be evaluated at least once per year, while at least every three – or six, if the farmer takes part in a quality chain system – months treatments with antimicrobials should be discussed.

It is possible the different explanations and places stating the evaluation frequencies of the drying-off strategy, dry cow management and antimicrobial treatments cause confusion amongst veterinarians. In my opinion there should therefore (in communication to veterinarians after reviewing the guideline and later on in the guideline) be made a clear distinction between:

1. The mandatory evaluation of antimicrobial treatment (once per three or six months) according to the UDD-regulation
2. The determination of the drying-off strategy in the BGP each year
3. The in the guideline advised scheduling of evaluation of dry cow management four times per year

Thereby, it could possibly be an option to conduct the advised four times of evaluation of dry cow management on the farm at the same time as the mandatory evaluation of antimicrobial treatments. However, if the farmer takes part in a quality chain system (and the mandatory evaluation thus only has to take place once every six months), the advised four times of evaluation of dry cow management will not be reached.

Content – Selection criteria

In general respondents to the questionnaire are positive about the content of the guideline dry cow therapy. However, many of the practitioners indicate they would like to see more freedom in the use of diverse selection criteria for making decisions on drying-off with or without antibiotics. Thereby, a large majority has a need for more selection criteria to be included in the guideline dry cow therapy.

When asked which selection criteria should be involved in the guideline and decision making on dry cow therapy and which criteria veterinarians thought their farmers currently use, there was given the opportunity to select a maximum of seven criteria from a given list. To make respondents prioritize the given answers and possibly shorten the list of most chosen selection criteria, the same question was asked, but then only a maximum of three answers could be selected. It would have been easier – for both the respondents and for the analysis – if veterinarians would have had the option to already prioritize the answers when selecting a maximum of seven criteria. However, this could not be achieved with the used online survey program (Survey Monkey).

Repeatedly chosen and mentioned selection criteria in the resulting list and comments given throughout the survey are: somatic cell count of the last MPR before drying off, somatic cell count during the previous lactation, a multifactorial risk-analysis, history of clinical mastitis and the milk production at dry-off. However, a part of these criteria – milk production at dry off, mastitis history (on the farm) etc. – indicate possible prophylactic use of antimicrobials, because the criteria do not make sure a cow is infected at that point in time. It only shows the cow is potentially at a higher risk of contracting an infection of the udder.

²⁰ Guideline ‘Application of antibiotics’, shortened to guideline TAM; in Dutch: Richtlijn Toepassing van antimicrobiële middelen, shortened to richtlijn TAM)

²¹ Quality chain system, in Dutch: Keten kwaliteit systeem (kwaliteitborgingssysteem voor de melkveehouderij)

Thus, it is not acceptable to use these criteria – which indicate possible prophylactic antibiotic use – in the decision making on dry-cow therapy (KNMvD 2014).

As frequently asked for, it is possible to integrate more selection criteria in the guideline dry cow therapy. However, all the criteria included in the guideline should be taken into consideration when drying-off a cow. The farmer will have to include each selection criterion in his decision on drying off a cow, while the veterinarian should include and evaluate more selection criteria in the drying off strategy (in the BGP) of a farm. This will provide farmers and veterinarians with more administrative burden than the guideline already brings with it. Because veterinarians indicated in this and a former study (Verduijn 2015) the guideline already brings a lot of administrative burden with it and as most selection criteria to be included in the guideline – in the opinion of practitioners – indicate possible prophylactic antimicrobial use, no more selection criteria for drying off cows should be incorporated in the guideline.

Content – Cell count cut-off values

Regarding the questions on the (practicable) cell count cut-off values only one-fifth of the total questioned veterinarians would like to see one cell count cut-off value for both cows and heifers. However, this group of veterinarians is divided on the equalized cell count cut-off value that should be chosen. Based on the answers to the questions regarding the cell count cut-off values, it seems not necessary to revise the values at this point in time. Although, it is possible communication (with farmers) about the cell count cut-off values being used will be easier if one value for both cows and heifers is used. However, in none of the given comments in this survey a communicational reason for changing the cell count cut-off values was stated. Therefore, the cell count cut-off values should, in my opinion, in the near future only be changed if there is information of new scientific research to do so.

Conclusion and advice

In general, the opinions of bovine practitioners on the guideline dry cow therapy seem to be positive. Nevertheless, the results and comments showed there is still a lack of clarity on the exact aim and way of interpreting and using the guideline and the frequency of evaluation of the drying-off strategy. Besides this, quite a few veterinarians stated their concerns on the guideline being presented as legislation. Hence, it is recommended to communicate to bovine practitioners in the Netherlands what exactly the base of the guideline is: only administer antimicrobial agents with a curative purpose, thus quitting prophylactic use of antibiotics in dry cows, following the current Dutch legislation. Thereby, veterinarians should be made aware that the guideline is designed to implement legislation on use of antibiotics in dairy cows in daily practice. It's therefore, the guideline can directly be applied at most of the dairy farms. However, it is possible and certainly allowed to deviate from the guideline, as long as this is underpinned and written down. In addition to that, decisions about whether or not applying antimicrobial therapy should be taken on cow-level, whereby there should be enough evidence of a current infection if administering antibiotics. Finally, there should be communicated, what the frequencies of evaluating dry cow therapy and drying off strategy in agreement with the UDD-regulation (and the guideline TAM) are.

According to comments made in the survey, interviewed bovine practitioners are also interested in objective measured effects of the guideline dry cow therapy. This could for example be national information about possible changes occurring in the incidence rate of (clinical) mastitis and culling due to mastitis. If there is opportunity and time to gain information about the effects of SDCT (and the guideline) in practice, it would be advisable to use this information in the completion of the evaluation of the guideline. Thereby, the information could also be communicated to veterinarians, as this would probably lead to positive feelings about involvement in improvement of the guideline.

Taking all results and previous short conclusions into consideration, bovine practitioners in the Netherlands are generally pleased with the guideline and there is no need to revise the guideline – including the cell count cut-off values – as a whole at this point in time. Additionally, only few results of the survey showed respondents being (slightly) divided on some of the subjects about the content of the guideline. Therefore, it is – in my opinion – not definitely needed to expand reviewing the guideline

further at this point in time. However, should the project team decide to expand the evaluation of the guideline, I would recommend to conduct an expert session (see Appendix C).

The communication paths used by the KNMvD during the introduction period of the guideline seem to have been effective in order to reach most of the bovine practitioners in the Netherlands. Hence, these paths should again be used in the communication on the foregoing uncertainties and point of interest regarding the guideline dry cow therapy to the bovine practitioners in the Netherlands.

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Appendix A

Vragenlijst evaluatie ‘Richtlijn Antimicrobiële middelen bij het droogzetten van melkkoeien’

Inleiding

De diergeneeskunde is altijd in beweging; vele veranderingen treden op, de wetgeving wordt strenger en er worden steeds hogere kwaliteitseisen aan de dierenarts gesteld. Daarnaast vervult de dierenarts niet enkel een sleutelrol in het verbeteren van diergezondheid en dierwelzijn, maar ook in het bewaken van de voedselveiligheid en volksgezondheid. Het maken van afwegingen tussen het belang van mens, dier, publiek en de eigen persoon kan lastig zijn.

Met richtlijnen willen de overheid en de KNMvD de positie van de dierenarts verstevigen en handvatten bieden voor het maken van bepaalde veterinaire beleidskeuzes en -beslissingen. Daartoe wordt in de richtlijn het best beschikbare bewijs naar de praktijk vertaald en biedt de richtlijn de dierenarts ondersteuning bij professionalisering van het vak. In de richtlijn droogzetten vindt u als dierenarts specifiek aanbevelingen en handvatten voor het voorschrijven en gebruiken van antimicrobiële middelen bij het droogzetten van koeien. Ze zijn gebaseerd op de beschikbare kennis over uiergezondheid en het droogzetten van melkkoeien. De aanbevelingen hebben tot doel het profylactisch gebruik van antimicrobiële middelen zoveel mogelijk te beperken zonder dat dit leidt tot een overmatige toename van curatief gebruik van antimicrobiële middelen vanwege (sub)klinische mastitis.

Het werken met richtlijnen in deze vorm is in de veterinaire praktijk nieuw. Een goede evaluatie van de introductie en het gebruik van richtlijnen helpt om eventuele knelpunten te identificeren en daar een oplossing voor te vinden. De KNMvD heeft geagendeerd dat de eerste (LHD-)richtlijn nu wordt geëvalueerd, te weten de ‘Richtlijn Antimicrobiële middelen bij het droogzetten van melkkoeien’. Middels het invullen van deze enquête draagt u daar aan bij.

Voordat u begint:

- *Daar waar gesproken wordt over de richtlijn droogzetten, wordt de ‘Richtlijn Antimicrobiële middelen bij het droogzetten van melkkoeien’ bedoeld.*
- *Wij realiseren ons dat er veel variatie kan zitten tussen uw melkveehouders. Wij willen u graag vragen uw antwoorden te geven op basis van de meest voorkomende situatie in uw dagelijkse praktijk.*
- *Per vraag is één antwoord mogelijk, tenzij anders aangegeven. Kies a.u.b. het antwoord dat het meest voor u van toepassing is.*

Communicatie van de richtlijn droogzetten

De richtlijn droogzetten is gepubliceerd op 4 november 2013 en vastgesteld als geldende norm op 10 januari 2014.

1. Hoe heeft u kennis genomen van het bestaan van de richtlijn droogzetten? (*meerdere antwoorden mogelijk*)

- E-mail update vanuit de KNMvD
- Persbericht vanuit KNMvD
- Website van de KNMvD
- Nieuwsbrief KNMvD
- Informatieve brief/Nieuwsbrief GGL
- Informatieve brief van de VGH
- Aankondiging in het Tijdschrift voor Diergeneeskunde (Tvd)
- Interview gezien op een bepaald medium
- Gesproken presentatie
- Via intercollegiaal overleg
- Anders: _____

2. Hoe vaak heeft u de richtlijn droogzetten het afgelopen jaar geraadpleegd? (*meerdere antwoorden mogelijk*)

- Elke werkdag
- Ongeveer 1x per week
- Ongeveer 1x per maand
- Ongeveer 1x in de 6 maanden
- Ongeveer 1x in het jaar
- Slechts éénmaal, daarna heb ik het geïntegreerd in de droogzetstrategie die ik mijn veehouders adviseer
- Geen idee
- Anders: _____

Geef aan in hoeverre u het eens bent met de volgende stellingen over de richtlijn droogzetten

3. Ik ben naar mijn idee snel en goed genoeg op de hoogte gebracht van de officiële invoering van de richtlijn droogzetten op 10 januari 2014.

- Eens
- Deels eens
- Neutraal
- Deels oneens
- Oneens
- Weet ik niet

4. Ik kon en kan de richtlijn droogzetten eenvoudig vinden.

- Eens
- Deels eens
- Neutraal
- Deels oneens
- Oneens
- Weet ik niet

Richtlijnen worden opgezet volgens een vast format. De richtlijn droogzetten bestaat uit drie onderdelen: I. de aanbevelingen, II. toelichting op de aanbevelingen in de hoofdtekst en III. de wetenschappelijke onderbouwing in de eindnoten incl. referentielijst.

5. De richtlijn droogzetten is zodanig opgebouwd dat ik geen overbodige informatie hoeft te lezen om bij de kerninformatie te komen.

Eens Deels eens Neutraal Deels oneens Oneens Weet ik niet

6. De aanbevelingen in de richtlijn zijn duidelijk en prettig omschreven.

Eens Deels eens Neutraal Deels oneens Oneens Weet ik niet

7. De geschreven tekst van de richtlijn droogzetten is voor mij taalkundig begrijpelijk.

Eens Deels eens Neutraal Deels oneens Oneens Weet ik niet

8. Het is goed dat er een richtlijn droogzetten is ontwikkeld.

Eens Deels eens Neutraal Deels oneens Oneens Weet ik niet

9. Het doel van de richtlijn droogzetten (zoals deze in de richtlijn beschreven is) is mij helder.

Eens Deels eens Neutraal Deels oneens Oneens Weet ik niet

Ruimte voor toelichting van de stellingen _____

Het gebruik van de richtlijn droogzetten

10. Heeft u de richtlijn droogzetten gebruikt bij het opstellen van het bedrijfsbehandelplan van uw melkveehouders?
- Ja en ik volg de in de richtlijn aangegeven koeselectiecriteria.
 - Ja, maar ik wijk af van de in de richtlijn aangegeven selectiecriteria als daar naar mijn idee aanleiding toe is.
 - Min of meer, maar ik ben er mijn eigen invulling aan gaan geven.
 - Nauwelijks.
 - Nee, in heb geen enkel onderdeel van de richtlijn hierin gebruikt.
 - Nee, ik adviseer mijn veehouders niet om selectief droog te zetten.

Toelichting _____

U hoeft verder enkel vraag 33 t/m 41 in te vullen indien het antwoord bij vraag 13 'Nee, ik heb geen enkel onderdeel van de richtlijn hierin gebruikt' of 'Nee, ik adviseer mijn veehouders niet om selectief droog te zetten.' betreft

11. Bij welk percentage van de melkveehouders die onder uw praktijkverantwoording vallen zijn de aanbevelingen uit de richtlijn droogzetten schriftelijk in het bedrijfsbehandelplan opgenomen?
_____ %

12. Op welke manier heeft u in het algemeen met de veehouders in uw praktijk gecommuniceerd over de richtlijn droogzetten? (*meerdere antwoorden mogelijk*)

- Stroomschema (flowchart(s) uit de richtlijn) in het bedrijfsbehandelplan opgenomen
- Mondelinge toelichting (telefonisch/bij bezoek aan/van de veehouder)
- Schriftelijke uitleg; specifiek per bedrijf
- Schriftelijke uitleg; algemene brochure/informatiebrief van de praktijk
- Praktijkbijeenkomst voor veehouders
- Studiegroepen
- Niet
- Anders, namelijk _____

Evaluatie van de implementatie van de richtlijn droogzetten

Na het toepassen van selectief droogzetten in de bedrijfsbehandelplannen van veehouders zult u dit gaan evalueren of reeds geëvalueerd hebben met uw veehouders.

13. Gebruikt u bij de evaluatie van het droogzetbeleid de richtlijn droogzetten?

- a. Ja en ik volg de in de richtlijn aangegeven aandachtspunten voor de evaluatie.
- b. Ja, maar ik wijk af van de in de richtlijn aangegeven aandachtspunten als daar naar mijn idee aanleiding toe is.
- c. Min of meer, maar ik ben er mijn eigen invulling aan gaan geven.
- d. Nauwelijks.
- e. Nee, in gebruik geen enkel onderdeel van de richtlijn hierin.
- f. Nee, ik adviseer mijn veehouders niet om selectief droog te zetten

Toelichting _____

14. Geef aan op welk percentage van uw veehouders de onderstaande frequenties van evaluatie van het droogzetbeleid van toepassing zijn. (let op: de ingevulde percentages achter de frequenties dienen samen 100% te bedragen)

- a. Maandelijks _____%
- a. Eens per twee maanden _____%
- b. Eens per kwartaal _____%
- c. Halfjaarlijks _____%
- d. Jaarlijks _____%
- e. Niet _____%

15. Aan welke punten besteedt u uitgebreid aandacht bij evaluatie van de uiergezondheid rondom de droogstand bij uw veehouders? (meerdere antwoorden mogelijk)

- a. Controle (doelstelling)
 - Roosters en bedekking ligboxen
 - Hygiëne afkalfstal
 - Spenen van droge koeien
 - Vliegenpreventie
- b. Infectiedruk (huisvesting en verzorging)
 - Roosters en bedekking ligboxen
 - Hygiëne afkalfstal
 - Spenen van droge koeien
 - Vliegenpreventie
- c. Weerstand (voeding en huisvesting)
 - Melkproductie bij het droogzetten (<12 kg)
 - Conditiescore van alle droogstaande koeien
 - Bekappen droge koeien
 - Vreetplekken
 - Ligplekken
- d. Melken (proces rondom het melken en de melkmachine)
 - Desinfectie spenen
 - Uitmelken na het afkalven
- e. Behandelen (diagnostiek en optimaal gebruik van antimicrobiële middelen)
 - Diagnostiek
 - Medicamenteuze therapie
 - Gebruik teat sealer

Stellingen – De toepasbaarheid en inhoud van de richtlijn droogzetten

Geef aan In hoe verre u het eens bent met de volgende stellingen over de inhoud van de richtlijn droogzetten:

16. De aanbevelingen uit de richtlijn droogzetten zijn goed toepasbaar in de praktijk.

- Eens Deels eens Neutraal Deels oneens Oneens Weet ik niet

17. De flowcharts opgenomen in de aanbevelingen van de richtlijn droogzetten zijn praktisch toepasbaar (voor de veehouder).

- Eens Deels eens Neutraal Deels oneens Oneens Weet ik niet

18. Ik ben tevreden over de wetenschappelijke onderbouwing ('eindnoten') van de richtlijn droogzetten.

- Eens Deels eens Neutraal Deels oneens Oneens Weet ik niet

19. Ik heb behoefte aan meer selectiecriteria voor het selectief droogzetten dan de criteria die in de richtlijn droogzetten meegenomen worden.

Voorbeelden van andere criteria kunnen zijn: de klinische mastitis historie van de koe, de melkproductie bij het droogzetten, het jaargetijde, etc.

- Eens Deels eens Neutraal Deels oneens Oneens Weet ik niet

20. Mijn mening over de richtlijn droogzetten is sinds de periode van in gebruik name positiever geworden.

- Eens Deels eens Neutraal Deels oneens Oneens Weet ik niet

Vragen – De inhoud van de richtlijn droogzetten

Selectiecriteria

21. Adviseert u uw veehouders ten aanzien van de selectie voor droogzetters om te selecteren op koeniveau (alle kwartieren hetzelfde) of op kwartierniveau (beslissing per kwartier)?

- a. Bij alle bedrijven op koeniveau
- b. Overwegend op koeniveau; van bedrijf tot bedrijf anders
- c. Bij alle bedrijven op kwartierniveau
- d. Overwegend op kwartierniveau; van bedrijf tot bedrijf anders

22. Welke selectiecriteria adviseert u te hanteren bij het selectief droogzetbeleid bij het merendeel van uw veehouders? (*maximaal 7 antwoorden mogelijk*)

- Het koecelgetal van de laatste MPR vóór droogzetten
 - Koecelgetal van de gehele afgelopen lactatie
 - Bepaling kwartiercelgetal
 - Tankmelkcelgetal
 - Bacteriologisch onderzoek van de tankmelk
 - Bacteriologisch onderzoek van het individuele dier
 - Geleidbaarheid
 - LDH-bepaling
 - Klinische mastitis historie van de afgelopen lactatie
 - Melkproductie bij het droogzetten
 - Melk lekken
 - Pariteit
 - Klinische beoordeling van de uier of melk (incl. speenproblemen)
 - Jaargetijde
 - Lactatiewaarde
 - Dit is geheel afhankelijk van de wens van de veehouder
 - Anders, namelijk _____
-

23. Welke drie selectiecriteria vindt u het belangrijkste in uw advies? (*maximaal 3 antwoorden mogelijk*)

- Het koecelgetal van de laatste MPR vóór droogzetten
- Koecelgetal van de gehele afgelopen lactatie
- Bepaling kwartiercelgetal
- Tankmelkcelgetal
- Bacteriologisch onderzoek van de tankmelk
- Bacteriologisch onderzoek van het individuele dier
- Geleidbaarheid
- LDH-bepaling
- Klinische mastitis historie van de afgelopen lactatie
- Melkproductie bij het droogzetten
- Melk lekken
- Pariteit

- Klinische beoordeling van de uier of melk (incl. speenproblemen)
 - Jaargetijde
 - Lactatiewaarde
 - Dit is geheel afhankelijk van de wens van de veehouder
 - Anders, namelijk _____
-

24. Welke selectiecriteria denkt u dat uw veehouders gebruiken? (*maximaal 7 antwoorden mogelijk*)

- Het koecelgetal van de laatste MPR vóór droogzetten
 - Koecelgetal van de gehele afgelopen lactatie
 - Bepaling kwartiercelgetal
 - Tankmelkcelgetal
 - Bacteriologisch onderzoek van de tankmelk
 - Bacteriologisch onderzoek van het individuele dier
 - Geleidbaarheid
 - LDH-bepaling
 - Klinische mastitis historie van de afgelopen lactatie
 - Melkproductie bij het droogzetten
 - Melk lekken
 - Pariteit
 - Klinische beoordeling van het uier of melk (incl. speenproblemen)
 - Jaargetijde
 - Lactatiewaarde
 - Dit is geheel afhankelijk van de wens van de veehouder
 - Anders, namelijk _____
-

25. Welke drie selectiecriteria worden door uw veehouders het meest gebruikt? (*maximaal 3 antwoorden mogelijk*)

- Het koecelgetal van de laatste MPR vóór droogzetten
 - Koecelgetal van de gehele afgelopen lactatie
 - Bepaling kwartiercelgetal
 - Tankmelkcelgetal
 - Bacteriologisch onderzoek van de tankmelk
 - Bacteriologisch onderzoek van het individuele dier
 - Geleidbaarheid
 - LDH-bepaling
 - Klinische mastitis historie van de afgelopen lactatie
 - Melkproductie bij het droogzetten
 - Melk lekken
 - Pariteit
 - Klinische beoordeling van het uier of melk (incl. speenproblemen)
 - Jaargetijde
 - Lactatiewaarde
 - Dit is geheel afhankelijk van de wens van de veehouder
 - Anders, namelijk _____
-

26. Indien uw veehouders (ook) andere criteria gebruiken dan de MPR voor bepaling van het al dan niet droogzetten met antibiotica, hoe doen veehouders hiervan dan hun verslaglegging?
- De veehouder noteert per koe de toegepaste diagnostiek en de uitslag in de bedrijfsadministratie.
 - De veehouder noteert van de koeien die drooggezet zijn met antibiotica in de bedrijfsadministratie welke diagnostiek is toegepast en wat de uitslag betrof.
 - De veehouder noteert niet welke diagnostiek is toegepast en wat de uitslag betrof, de manier van bepaling al dan niet met antibiotica droog te zetten staat namelijk in het bedrijfsbehandelplan genoteerd.
 - De veehouder noteert niet welke diagnostiek is toegepast en wat de uitslag betrof.
 - Niet van toepassing op mijn veehouders, deze maken allen enkel gebruik van de MPR.

De volgende vraag is enkel te beantwoorden indien u uw veehouders adviseert gebruik te maken van het koecelgetal als één van de selectiecriteria voor het selectief droogzetten:

27. Celgetalafkapwaarden van 150.000 voor vaarzen en 50.000 voor koeien (maximaal 6 weken voor het droogzetten bepaald) zijn werkbaar en praktisch.
- Eens, dit is prima te hanteren.
 - Deels eens, maar ik snap niet waar het op gebaseerd is.
 - Oneens, dit zou voor koeien en vaarzen gelijk moeten zijn.
 - Oneens, de waarden zijn niet werkbaar en zouden als volgt moeten zijn
 - Koeien: _____
 - Vaarzen: _____

Algemene opmerkingen _____

28. Op basis van welke criteria in het algemeen zouden volgens u koeien voor behandeling bij het droogzetten geselecteerd moeten worden?
- Op basis van de celgetalcriteria zoals in de richtlijn droogzetten staat.
 - Op basis van de criteria die in de richtlijn droogzetten staan, maar met andere celgetalafkapwaarden dan 150.000 voor vaarzen en 50.000 voor koeien.
 - Elke koe bacteriologisch onderzoek.
 - Elk kwartier bacteriologisch onderzoek.
 - Geen selectiecriteria, veehouder zelf laten bepalen.
 - Anders, namelijk _____

Management Uiergezondheid

29. Adviseert u uw veehouders om bij het selectief droogzetbeleid gebruik te maken van interne teat sealers?

- a. Ja
- b. Van bedrijf tot bedrijf anders (meestal wel)
- c. Van bedrijf tot bedrijf anders (meestal niet)
- d. Nee

Indien het antwoord op de vorige vraag 'nee' was mag u deze vraag overslaan

30. Bij welke dieren adviseert u om een interne teat sealer te gebruiken?

(meerdere antwoorden mogelijk)

- a. Bij alle droog te zetten dieren
- b. Bij hoog celgetal dieren in combinatie met antibioticum
- c. Bij hoog celgetal dieren die zonder antibioticum worden drooggezet
- d. Bij laag celgetal dieren in combinatie met antibioticum
- e. Bij laag celgetal dieren die zonder antibioticum worden drooggezet
- f. Anders, namelijk _____

Effecten van de richtlijn droogzetten

Vul bij de onderstaande vragen in wat volgens u het meest van toepassing is:

31. Als ik een schatting moet maken is de incidentie van (klinische) mastitis bij het overgrote deel van mijn veehouders sinds de invoering van de richtlijn droogzetten (2014):
- a. Sterk toegenomen ($\geq 15\%$)
 - b. Licht toegenomen ($< 15\%$)
 - c. Ongeveer gelijk gebleven
 - d. Licht afgenumen ($< 15\%$)
 - e. Sterk afgenumen ($\geq 15\%$)
 - f. Weet ik niet
 - g. Deze informatie deel ik liever niet
32. Als ik een schatting moet maken is de afvoer ten gevolge van mastitis bij het overgrote deel van mijn veehouders sinds de invoering van de richtlijn droogzetten (2014):
- a. Sterk toegenomen ($\geq 15\%$)
 - b. Licht toegenomen ($< 15\%$)
 - c. Ongeveer gelijk gebleven
 - d. Licht afgenumen ($< 15\%$)
 - e. Sterk afgenumen ($\geq 15\%$)
 - f. Weet ik niet
 - g. Deze informatie deel ik liever niet
33. Ik ben goed bezig met advisering over selectief droogzetten.

Eens Deels eens Neutraal Deels oneens Oneens Weet ik niet

Tenslotte

34. Wat is het aantal rundveedierenartsen dat werkzaam is in uw praktijk?
_____ rundveedierenartsen

35. Hoeveel dagdelen per week (0-10) bent u werkzaam in de melkveehouderij?
_____ dagdelen

36. Wat is het aantal melkveebedrijven dat verbonden is aan uw praktijk?
_____ melkveebedrijven

37. Wat is in uw praktijk de afspraak ten aanzien van de advisering omtrent selectief droogzetten?

- a. We hebben één praktijkbeleid afgesproken gebaseerd op de 'Richtlijn Selectief droogzetten', dat we allemaal uitdragen
- b. We hebben gezamenlijk een praktijkbeleid opgesteld dat afwijkt van de 'Richtlijn Selectief droogzetten' en dat dragen we allemaal uit
- c. Elke collega bepaalt zijn eigen advies en draagt hier eigen verantwoordelijkheid voor
- d. Eénmanspraktijk; mijn eigen beleid is praktijkbeleid

Personalia

38. Geboortejaar : _____

39. Afstudeerjaar : _____

40. Geslacht : Vrouw / Man

41. Indien u graag een rapportage van de enquête zou willen ontvangen, kunt u hier uw e-mailadres invullen : _____

Hartelijk dank voor uw deelname!

Mocht u opmerkingen en/of aanvullingen hebben ten aanzien van de richtlijn of de enquête, dan nodigen wij u van harte uit deze in de onderstaande tekstvakken voor ons achter te laten.

Namens de KNMvD willen wij u hartelijk danken voor de tijd die u genomen heeft voor het invullen van deze enquête! Door op onderstaande knop "gereed" te klikken, worden uw antwoorden definitief bij ons opgeslagen. We zullen uw gegevens vertrouwelijk behandelen.

Opmerkingen en aanvullingen ten aanzien van de communicatie van de richtlijn droogzetten:

Opmerkingen en aanvullingen ten aanzien van de implementatie van de richtlijn droogzetten:

Opmerkingen en aanvullingen ten aanzien van de praktische toepasbaarheid en inhoud van de richtlijn droogzetten:

Opmerkingen en aanvullingen ten aanzien van de enquête:

Appendix B - Additional presentation of results

Demographic information

Table 1 Comparison of the distribution of gender of the survey respondents and the list of survey recipients

		Category	N	Observed Prop.	Test Prop.	Exact Sig. (1-tailed)
<u>Gender</u>	Group 1	Men	116	0,72	0,72	0,53
	Group 2	Women	45	0,28		
		Total	161	1		

Table 2 Gender and year of birth

Year of birth	Mean	Std. Deviation	Minimum	Maximum	95%-Confidence interval
<u>Women</u>	1976	8,4	1955	1988	1976 ± 2,5
<u>Men</u>	1970	10,2	1951	1988	1970 ± 1,9
<u>Total</u>	1971	10,1	1951	1988	1971 ± 1,6

Table 3 Gender and year of graduation

Year of graduation	Mean	Std. Deviation	Minimum	Maximum	95%-Confidence interval
<u>Women</u>	2003	7,4	1984	2013	2003 ± 2,2
<u>Men</u>	1997	9,9	1976	2014	1997 ± 1,8
<u>Total</u>	1999	9,6	1976	2014	1999 ± 1,5

Practice-related information

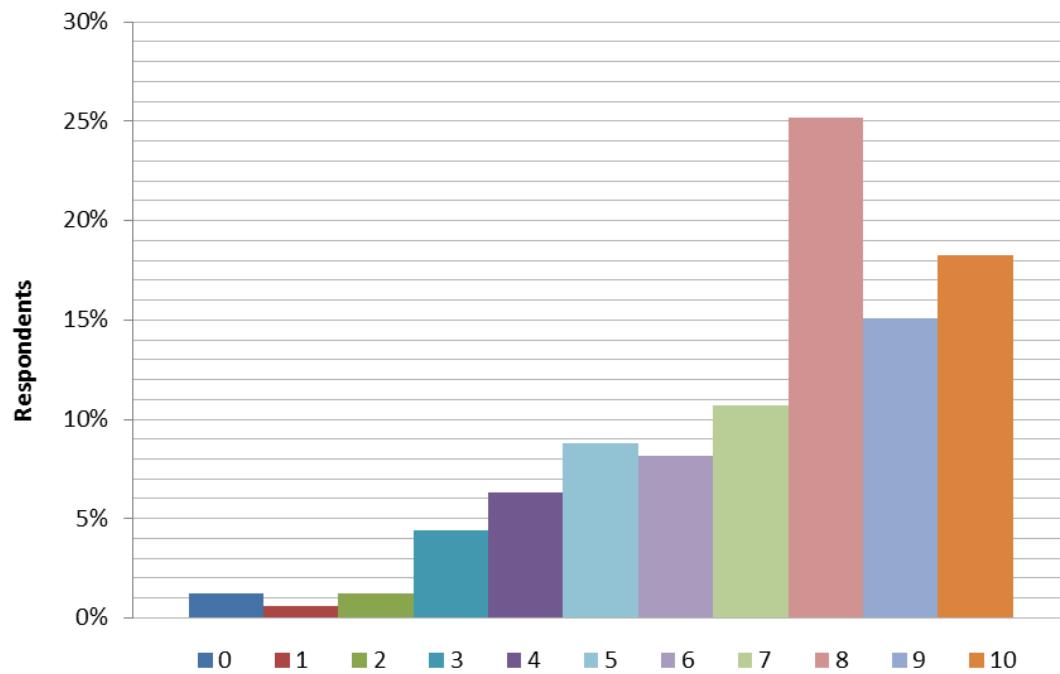


Figure 1 Distribution of dayparts bovine practitioners are working in the dairy industry (N=88%)

Communication

Information about the guideline and access to it

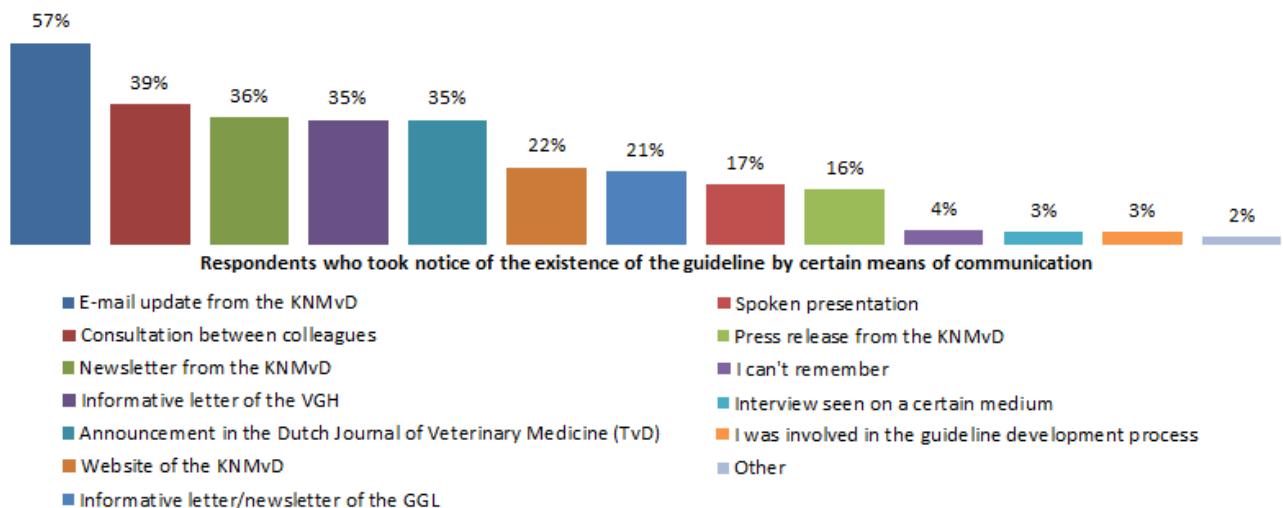


Figure 2 Distribution of how there is taken notice of the existence of the guideline dry cow therapy (N=100%)

Structure and writing of the guideline dry cow therapy

Table 4 The opinion of bovine practitioners on various statements regarding the guideline (N=100%)

		Agree	Partly agree	Neutral	Partly disagree	Disagree	I do not know	Total
I was fast and well enough informed about the official implementation of the guideline dry cow therapy. (statement nr. 1)	Count (N)	76	46	24	18	14	2	180
	Row N %	42%	26%	13%	10%	8%	1%	100%
I can easily find the guideline dry cow therapy. (statement nr. 2)	Count (N)	93	45	28	6	3	5	180
	Row N %	52%	25%	16%	3%	2%	3%	100%
The guideline is structured in such a way that I do not have to read any unnecessary information to get to the core information. (statement nr. 3)	Count (N)	47	57	39	22	10	5	180
	Row N %	26%	32%	22%	12%	6%	3%	100%
The recommendations in the guideline dry cow therapy are defined clear and pleasant. (statement nr. 4)	Count (N)	45	53	45	22	12	3	180
	Row N %	25%	29%	25%	12%	7%	2%	100%
The written text of the guideline is linguistically understandable to me. (nr. 5)	Count (N)	105	43	25	2	2	3	180
	Row N %	58%	24%	14%	1%	1%	2%	100%
I agree with the fact that this guideline has been developed. (statement nr. 6)	Count (N)	81	54	19	12	13	1	180
	Row N %	45%	30%	11%	7%	7%	1%	100%
The aim of the guideline dry cow therapy (as described in the guideline) is clear to me. (statement nr. 7)	Count (N)	107	50	12	3	6	2	180
	Row N %	59%	28%	7%	2%	3%	1%	100%

Table 5 Medians and interquartile range(s) of opinions on various statements regarding the guideline (N=100%)

	<u>N*</u>	<u>Median</u>	<u>Range</u>	<u>Interquartile range</u>
I was fast and well enough informed about the official implementation of the guideline dry cow therapy. (statement nr. 1)	178	2	4	2
I can easily find the guideline dry cow therapy. (statement nr. 2)	175	1	4	1
The guideline is structured in such a way that I do not have to read any unnecessary information to get to the core information. (statement nr. 3)	175	2	4	2
The recommendations in the guideline dry cow therapy are defined clear and pleasant. (statement nr. 4)	177	2	4	2
The written text of the guideline is linguistically understandable to me. (statement nr. 5)	177	1	3	1
It's right that this guideline has been developed. (statement nr. 6)	179	2	4	1
The aim of the guideline dry cow therapy (as described in the guideline) is clear to me. (statement nr. 7)	178	1	4	1

* The answer 'I do not know' is not included in the analysed number of answers.

Implementation

Use of the guideline dry cow therapy

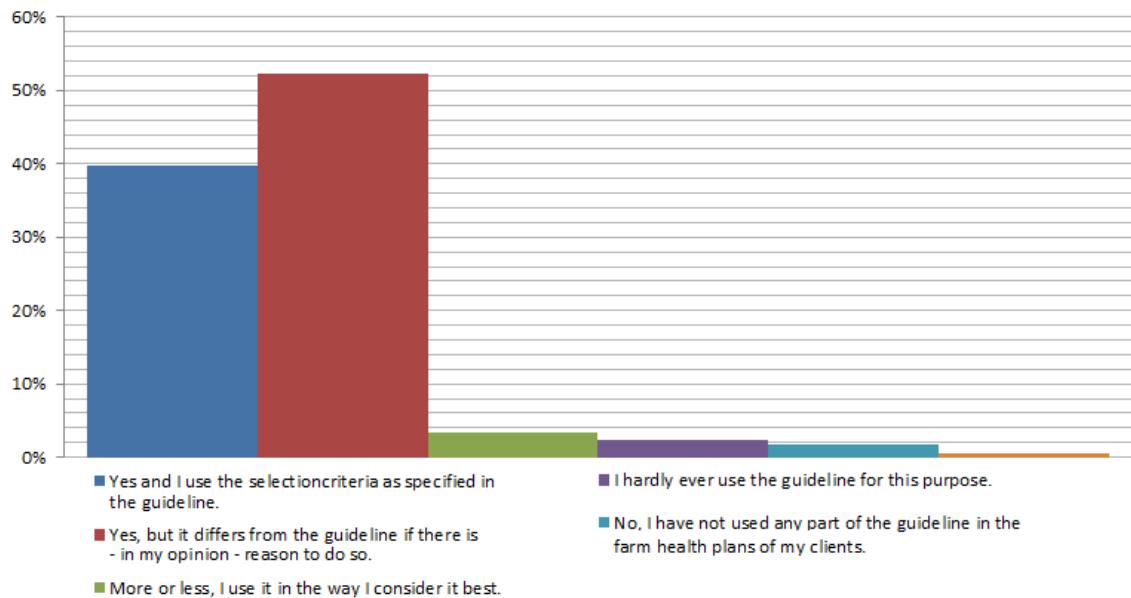


Figure 3 Breakdown percentage of veterinarians using the guideline dry cow therapy when drafting the farm health plan of their clients (N=98%)

Evaluation of the implementation of the guideline dry cow therapy

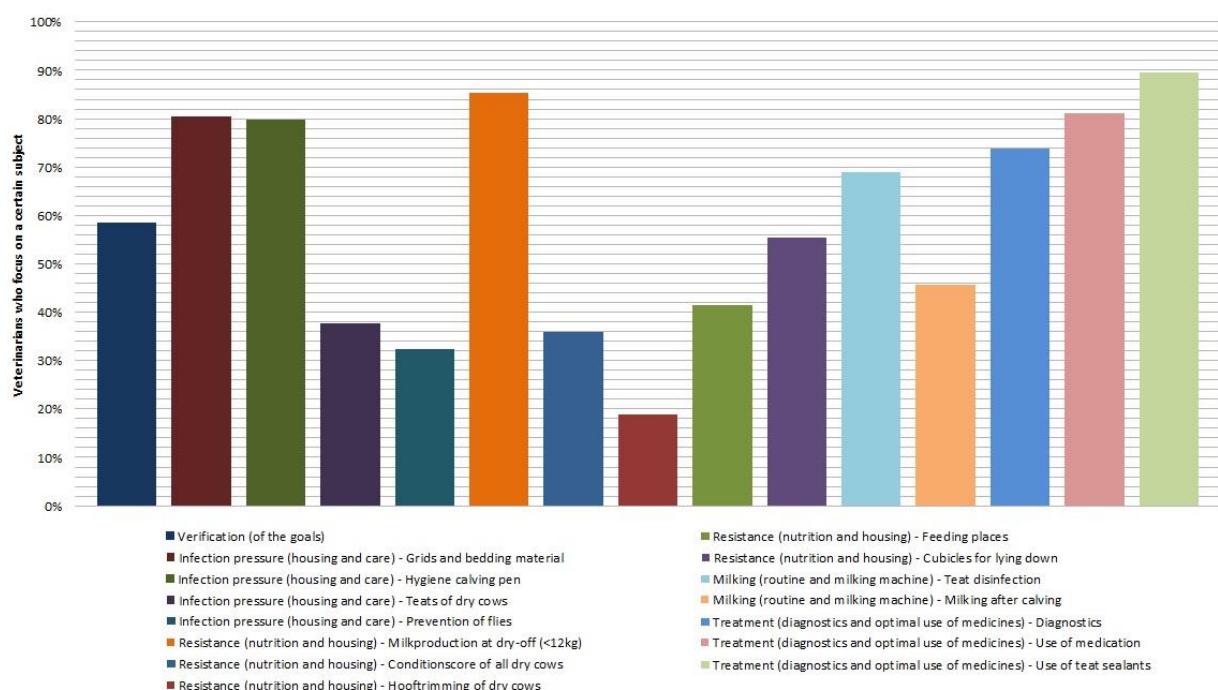


Figure 4 Subjects the questioned veterinarians focus on when evaluating udder health (with specific attention to the dry cow period) at dairy farms (N=91%)

Content

Statements on content and applicability of the guideline

Table 6 The opinion of bovine practitioners on various statements regarding (content of) the guideline (N=91%)

		Agree	Partly agree	Neutral	Partly disagree	Disagree	I do not know	Total
The recommendations in the guideline dry cow therapy are applicable in practice. (statement nr. 1)	Row N%	21%	44%	10%	14%	9%	1%	100%
	Count	35	72	17	23	14	2	163
Flowcharts in the recommendations from the guideline dry cow therapy are practically useful (for the farmer). (statement nr. 2)	Row N%	31%	28%	28%	4%	6%	3%	100%
	Count	51	46	45	7	9	5	163
I am satisfied with the scientific literature ('endnotes') underpinning the content of the guideline dry cow therapy. (statement nr. 3)	Row N%	15%	27%	23%	13%	18%	4%	100%
	Count	24	44	38	21	30	6	163
I have a need for more selection criteria, than the selection criteria used for selective dry cow therapy following the guideline dry cow therapy. Examples are: history of clinical mastitis, milk production at drying-off, the time of year, etc. (statement nr. 4)	Row N%	64%	20%	9%	1%	4%	1%	100%
	Count	105	33	15	2	6	2	163
My opinion about the guideline dry cow therapy became more positive after the start-up phase. (statement nr. 5)	Row N%	14%	27%	33%	8%	17%	1%	100%
	Count	23	44	54	13	27	2	163

Table 7 Medians and interquartile ranges of opinions on statements regarding the content of the guideline (N=91%)

	N*	Median	Range	Interquartile range
The recommendations in the guideline dry cow therapy are applicable in practice. (statement nr. 1)	161	2	4	1
Flowcharts in the recommendations from the guideline dry cow therapy are practically useful (for the farmer). (statement nr. 2)	158	2	4	2
I am satisfied with the scientific literature ('endnotes') underpinning the content of the guideline dry cow therapy. (statement nr. 3)	157	3	4	2
I have a need for more selection criteria, than the selection criteria used for selective dry cow therapy following the guideline dry cow therapy. Examples are: history of clinical mastitis, milk production at drying-off, the time of year, etc. (statement nr. 4)	161	1	4	1
My opinion about the guideline dry cow therapy became more positive after the start-up phase. (statement nr. 5)	161	3	4	2

* The answer 'I do not know' is not included in the analysed number of answers.

Selection criteria

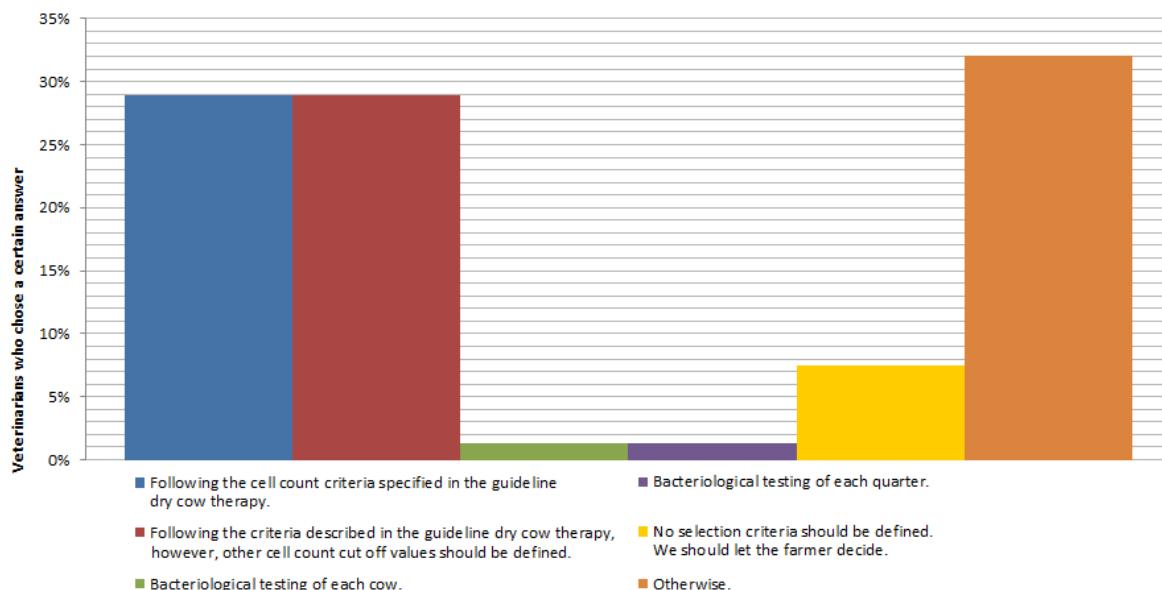
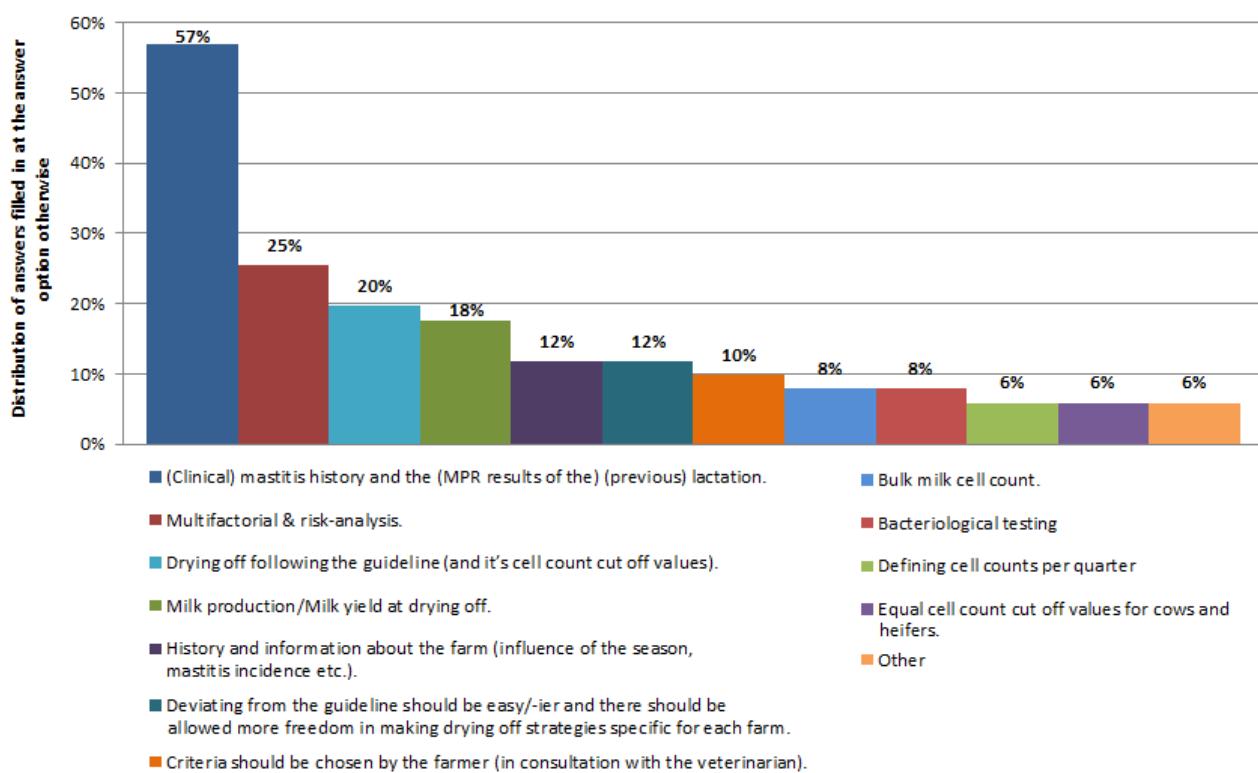


Figure 5 Opinion of veterinarians on the criteria that should be used in selection for dry cow therapy (N=88%)



**Figure 6 The detailed and grouped answers given at the answer option 'otherwise' to be found in Figure 5
Opinion of veterinarians on the criteria that should be used in selection for dry cow therapy (32% of N=88%)**

Cell count cut-off values

Table 8 Practicable cell count cut-off values for both cows and heifers according to bovine practitioners (N=38%)

<u>Descriptive parameter</u>	<u>Cows</u>	<u>Heifers</u>
Mean	66812	74420
Standard deviation	29667	33678
Median	50000	50000
Mode	50000	50000
Minimum	0,00	0
Maximum	150000,00	150000
Confidence interval (95%)	66812 ± 7127	74420 ± 8090

Udder health management

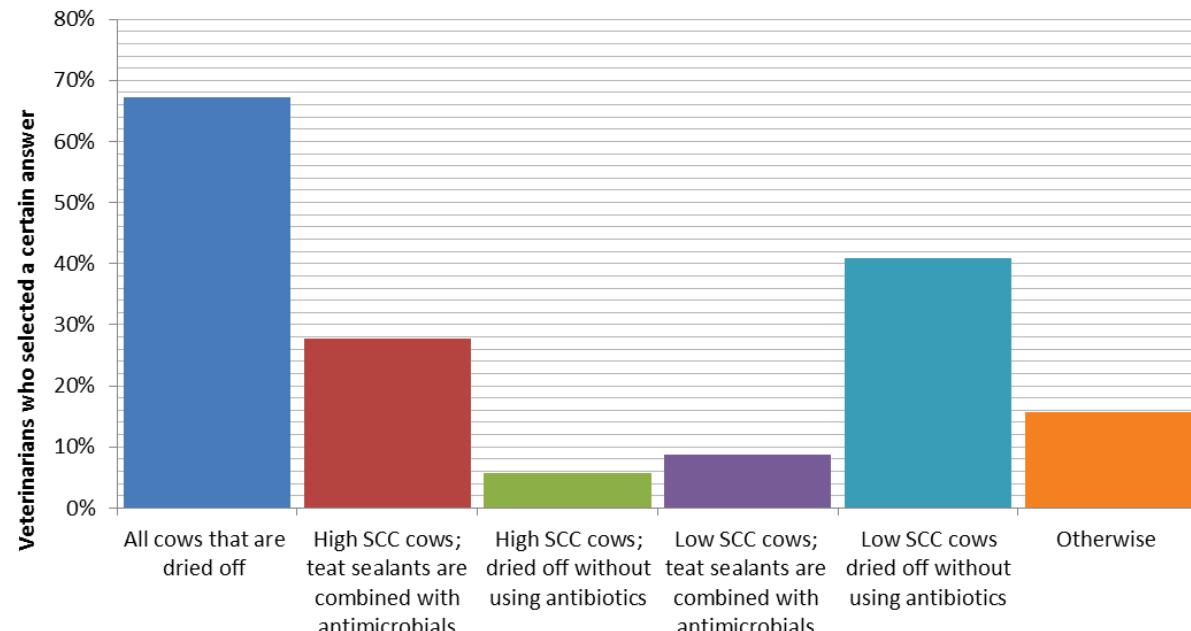


Figure 7 Breakdown percentage of veterinarians advising for which cows to use internal teat sealants during the drying-off period (N=88%)

Effects of selective dry cow therapy

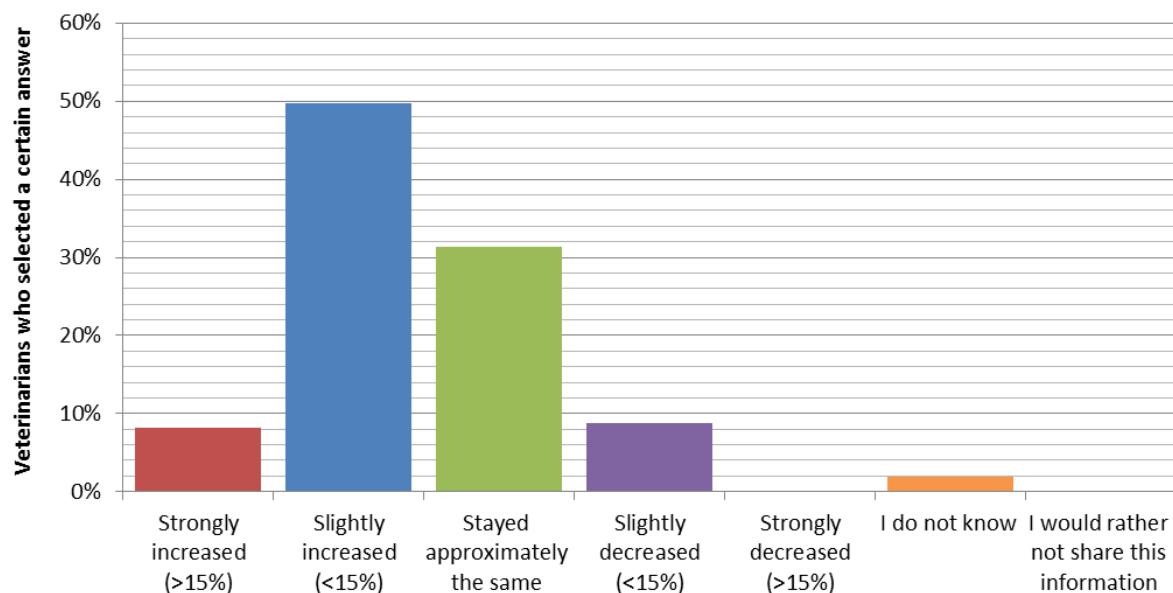


Figure 8 Perception of veterinarians on changes in the incidence rate of mastitis since the introduction of the guideline dry cow therapy (N=88%)

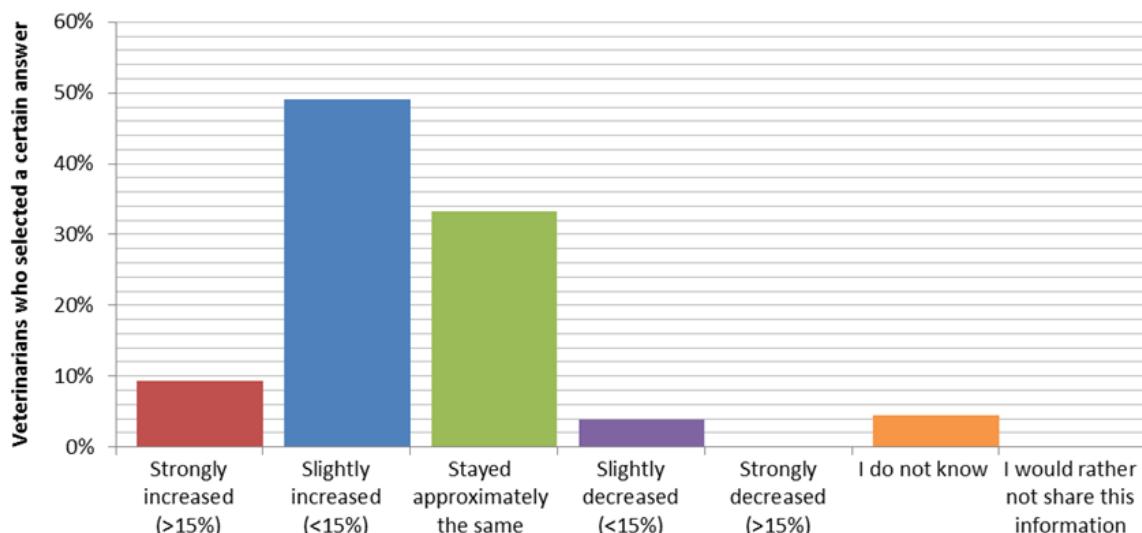


Figure 9 Perception of veterinarians on changes in the rate of culling due to mastitis since the introduction of the guideline dry cow therapy (N=88%)

Appendix C



Evaluatie richtlijn droogzetten

Plan van aanpak – Expert sessie

Introductie

Voor het uitvoeren van een groot deel van de evaluatie is er gekozen voor het opstellen en verspreiden van een enquête onder rundveedierenartsen in Nederland. In de enquête kan er met name gevraagd worden naar de communicatie en de implementatie van de richtlijn onder dierenartsen. Vragen die hierbij beantwoord dienen te worden zijn: "Kennen dierenartsen de richtlijn? Zo niet, waar is het fout gegaan? Wat kunnen we doen om dit te herstellen of verbeteren bij invoer van een nieuwe RL? Weten dierenartsen ook wat er daadwerkelijk in de RL staat? Is de RL gelezen/gebruikt/geïmplementeerd?".

Het is echter ook zaak dat eventuele knelpunten m.b.t. de wetenschappelijke achtergrond van (de selectiecriteria in) de richtlijn ontdekt worden. Het uitdiepen van deze knelpunten en het vragen naar oplossingen mb.t. de inhoud van de richtlijn zal dan ook middels een 'expert sessie' gedaan worden.

Expert sessie

Tijdens dit onderdeel van de evaluatie zullen enkele dierenartsen ('experts') vanuit het betrokken vakgebied delen van de richtlijn tegen het licht houden. Reacties op knelpunten (in de inhoud) kunnen gegeven worden, waarna er ook gedacht kan worden aan oplossingen of verbeteringen hiervoor. Als er inhoudelijke kennis ontbreekt kunnen 'expert guesses' gebruikt worden om toch tot een consensus te kunnen komen.

Voor de vorm van de expert sessie zijn er enkele mogelijkheden. Deze verschillen van elkaar in omvangrijkheid (tijd), 'professionaliteit' en significantie:

- De Delphi methodeⁱⁱⁱ: Een onderzoek dat van origine bedoeld is om op een zo betrouwbaar mogelijke wijze te komen tot een gemeenschappelijke stellingname over bijvoorbeeld beleidsbeslissingen. Deelnemers krijgen herhaaldelijk, in verschillende rondes, de mogelijkheid hun zegje te doen, waarbij verschillende communicatievormen gebruikt kunnen worden (enquête, group decision support systemen, etc.). Hierna treedt een terugkoppel-mechanisme in werking: verkregen informatie wordt vastgelegd en op gezette tijden terug gerapporteerd aan de deelnemers. De panelleden krijgen dan opnieuw de gelegenheid hun antwoord bij te stellen, waarna er in de volgende rondes op basis hiervan nieuwe vragen worden ontwikkeld en voorgelegd. Zo kan men een conversatie op gang brengen en een zo groot mogelijk meerderheidsstandpunt verkrijgen. Het berekenen van statistische grootheden, zoals de mediaan of het groepsgemiddelde van antwoorden, op een vraag is uiteindelijk ook mogelijk. De grootste nadelen van deze methode zijn het feit dat de methode veel tijd en middelen kost en de rol van de onderzoeker erg subjectief is (, aangezien deze bepaalt wat er teruggekoppeld wordt).
- Monte Carlo Expert Analysisⁱⁱⁱ: Deze expert sessie methode is enkele jaren geleden succesvol gebruikt in een onderzoek van Kirsten Huijps en Henk Hogeweegen. De experts in het panel worden verschillende vragen/stellingen (bijvoorbeeld: 'Wat is de effectiviteit (%) van een bepaalde

Evaluatie richtlijn droogzetten

managementmaatregel?’) voorgelegd. Zij dienen hierop als antwoord de ‘laagst mogelijke waarde’, de ‘hoogst mogelijke waarde’ en ‘de meest waarschijnlijke waarde’ te geven. Elke expert-guess krijgt vervolgens volgens @Risk (Palisade Corporation, Ithaca, NY^{iv}) zijn eigen waarde/verdeling, waarna uiteindelijk alle waardes/verdelingen van de expert-antwoorden op een bepaalde vraag gecombineerd worden en er een expert-minimum, -maximum en – gemiddelde per vraag uitkomen. Het grootste voordeel is dat deze evaluatie wel en niet face-to-face uitgevoerd kan worden en er statische analyse van de resultaten plaats kan vinden. Hierdoor is de significantie van deze onderzoeks methode gekwantificeerd.

- **Brainstormen:** Deze methode is basaal gezien hetzelfde als de Delphi methode. Echter, deze wordt vorm gegeven als een face-to-face groepsbijeenkomst. Anonimitet in antwoorden op de stellingen wordt hierbij i.t.t. bij de Delphi methode dus niet gewaarborgd. Voordeel t.o.v. de Delphi is dat directe terugkoppeling van informatie naar de experts mogelijk is en er dus op kortere termijn tot een consensus gekomen kan worden. Een statische analyse van het brainstormen is erg lastig, met name als het qua vorm zal gaan lijken op interviews welke als volgende beschreven wordt.
- **Interview:** Ook het houden van groeps- of individuele interviews is een mogelijkheid voor het verkrijgen van de mening van experts t.a.v. de knelpunten in de richtlijn. Er zal zorg gedragen moeten worden voor een onafhankelijk en duidelijke interviewer en een goede manier van opnemen/meeschrijven tijdens de gesprekken. Een goede analyse van expert interviews is niet gemakkelijk en zal – wanneer de expert sessie tijdens de onderzoeksperiode van de student wordt uitgevoerd – dan ook niet bijdragen aan de wetenschappelijke uitvoering van de evaluatie door de student.

Conclusie

Er is relatief weinig tijd voor het onderzoek van de student beschikbaar. De expert sessie behoort echter toch significant en analyseerbaar uitgevoerd te worden. De Delphi methode valt daarmee als eerste optie af. Voor een goede uitvoering hiervan zijn te veel tijd en middelen nodig. De meest logische keuze lijkt daarna de Monte Carlo Expert Evaluation, welke in de kortste tijd de meest betrouwbare en analyseerbare data op zal leveren. Wanneer er toch liever gekozen wordt voor een simpelere benadering, dan zijn de brainstormsessie en het interview nog eventuele opties. De voorkeur gaat op dit moment echter uit naar de Monte Carlo Expert Evaluation mits het haalbaar is duidelijke vragen te formuleren a.d.h.v. de uitkomsten van de enquête.

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- i. De Delphi-methode nader bekijken:
<http://www.samenspraakadvies.nl/publicaties/Handout%20delphi%20onderzoek.pdf>
 - ii. Van Der Fels-Klerx, Ine H.J.; Goossens, Louis H.J.; Saatkamp, Helmut W.; Horst, Suzan H.S.; Elicitation of Quantitative Data from Heterogeneous Expert Panel: Formal Process and Application in Animal Health; Risk Analysis, 22: 67–81. doi: 10.1111/0272-4332.t01-1-00007
 - iii. Combining Literature and Expert Values as Input for Economic Models: Monte Carlo Expert Evaluation Analysis (zie bijlage in de mail)
 - iv. <https://www.palisade.com/risk/>