Impact matrix analysis and cost-benefit calculations to improve management practices regarding health status in organic dairy farming

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- Deliverable -

D4.2 - Report on the use of homeopathy in agricultural practice - Studies from dairy farms in Germany, France and Spain

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Executive Summary

This document provides an overview of the current use of homeopathic remedies on organic dairy farms in Germany, France and Spain. The results of the survey displayed considerable heterogeneity in the use of homeopathic remedies on the farms within and between countries. The on-farm assessment of the conditions existing on many farms for homeopathic treatment often revealed poor hygiene and preventive management. Separate sick pens were rarely available. Most farmers used boxes for both diseased and calving animals without implementing some kind of disinfection measures. Early detection measurements (e.g. body condition scoring, foremilk samples, udder palpation, the California mastitis test, measurement of body temperature etc.) were rarely performed and - if implemented - seldom documented. Thus, structural and non-structural preconditions📖 on the test farms were often far from being appropriate to ensure the early detection of diseased animals and target-oriented treatment.

The questionnaires to the farms revealed that there were no uniform treatment procedures in the use of homeopathy, neither for anamnesis, diagnosis nor for selection and application of the homeopathic remedy. Each farmer seems to have developed his/her own homeopathic treatment strategy; regardless of the principles of homeopathy. Moreover, most farmers only had a poor level of awareness of the principles of homeopathy; as evaluated by the homeopathic experts. In many cases, farmers' behaviour was illegal by making use of homeopathic products not approved for food-producing animals without involving the veterinarian to rededicate📖 these products for human use by following both European regulations and the cascade principle. The assessment of treatment success was mainly performed only visually by the farmers, increasing the risks that partially recovered or subclinical diseases can be overlooked resulting in relapse or chronic disease. Finally, it was revealed that homeopathic treatment and the outcomes were rarely or never documented. Therefore, no information about the homeopathic substances applied and the healing rates for food-producing animals under homeopathic treatments are available. The results indicate that a homeopathic *lege-artis*📖 treatment of diseased food-producing animals is missing. Thus, the self-referential approach in the use of homeopathy by farmers clearly increases the risk of extended suffering for diseased animals.

It is concluded that the treatment with homeopathic remedies in farm practice leaves ample room for improvement. A main barrier seems to be the fact that, for several reasons, farmers do not implement appropriate follow-up checks to assess whether treatment is effective in the farm situation. Farmers neither face penalties nor benefit regarding possible efforts in increasing treatment success. While ignoring the differences between milk from healthy and diseased cows and paying the same premium price, retailers do not offer adequate incentives but promote unfair competition. As a consequence, a high number of farmers strive for a reduction in labour and production costs to the expense of treatment success and animal health and welfare. The Commission Regulation (EC) No 889/2008 is not suited to prevent unfair competition and inappropriate treatment and should thus be reconsidered.

Table of Contents

1 Introduction

In the context of the production of food of animal origin, the prevalence of production diseases in farm animals, the use of antibiotics in livestock production and the development of antibiotic resistance has become an important issue of public concern. Treatments with homeopathic products are considered by various stakeholders as one option to reduce the use of antibiotics. However, although it might be seen as a relevant and serious alternative, the effectiveness of homeopathy when treating food producing animals must at least be ensured to the same degree as the use of allopathic remedies. Otherwise, the use of alternatives would be realised to the expense of animal health and welfare and food safety.

Production diseases emerge from factors within and outside the organisms as well as from the interactions between both. The healing process involves in an analogous manner various variables inside and outside of the organism, including the appropriateness of treatment as well as the context in which the treatment and the reactions of the animals towards the treatment takes place. Thus, the success of treatment, either with alternative or conventional medicinal products, cannot be discussed adequately while focussing on the remedy used but has to consider the context in which healing and treatment takes place. The interactions between processes within the organism, external variables in the living conditions and the treatment strategy form an indivisible trinity. From a scientific perspective, this trinity pose a serious challenge which cannot be adequately approached with the predominant *ceteris-paribus* assumptions. This is especially true for the use of homeopathy which raise even more questions than the use of conventional remedies. On the other hand, the treatment issue provokes not merely academic questions but many real life issues, not least the success with respect to the superordinate protective aim to reduce suffering of diseased farm animals.

In some European countries, homeopathic remedies are widely used to treat food producing animals (Löscher, 2006; Ullman, 2010). This is particularly the case in organic livestock production due to the general reluctance towards chemically-synthesized production tools. Furthermore, the EU Regulation (834/2007) promotes the use of phytotherapy and homeopathy in organic livestock production. The Commission Regulation (EC) No 889/2008, laying down detailed rules for the implementation of Council Regulation (EC) No 834/2007 on organic production, prescribes in Article 24 (veterinary treatment):

1. Where despite preventive measures to ensure animal health as laid down in Article 14(1)(e)(i) of Regulation (EC) No 834/ 2007 ***animals become sick or injured they shall be treated immediately****, if necessary in isolation and in suitable housing.*

2. Phytotherapeutic (herbal products), ***homeopathic products****, trace elements and products listed in Annex V, part 3 and in Annex VI, part 1.1.* ***shall be used in preference*** *to chemically-synthesized allopathic veterinary treatment or antibiotics,* ***provided that their therapeutic effect is effective*** *for the species of animal, and the condition for which the treatment is intended.*

3. ***If the use*** *of measures referred to in paragraph 1 and 2* ***is not effective*** *in combating illness or injury,* ***and if treatment is essential to avoid suffering or distress of the animal****, chemically synthesized* ***allopathic veterinary medicinal*** *products or antibiotics* ***may be used*** *under the responsibility of a veterinarian.*

The issue of alternative treatments is a very complex one. It is not only a question of the effectiveness of the remedies themselves (which needs to be proven in randomized clinical control

studies) but also depends to a high degree on the context and the precondition when people make use of alternative remedies. These preconditions include among others:

- Expertise to formulate a thorough anamnesis and diagnosis and to select an appropriate homeopathic remedy according to the leading symptoms,
- Diagnostic in relation to potential resistance to therapy,
- Availability of expertise on alternative treatments,
- Options for the appropriate application of remedies, and
- Regular checks on the effects of the given remedy on the animal and success of treatment.

In addition to these preconditions, the conditions on the farms also come into focus. While a high degree of similarity between management practices on organic and non-organic farms was found in a study by Langford et al. (2009) (assessing forty paired organic and non-organic dairy farms in UK), treatment of disease occurs differently across farm types. The majority (82.5%) of organic farmers treated early stages of mastitis with alternative remedies. Antibiotics were used when symptoms worsened or took a long time to clear. These farmers believed that 57.5% of mastitis was cured without antibiotic use. The results, however, could harbour perception bias as they are based on farmers' recall of information and not on clinical data. According to the results of a questionnaire in Germany, cessation of the withdrawal time📖 is the main criterion for farmers' use of homeopathy (Leon et al., 2006). Further reasons - singular or in combination - include:

- Homeopathy and phytotherapy can be used without consulting the vet;
- These remedies are less expensive;
- The use of homeopathy and phytotherapy neither results in residues in food and manure nor is expected to provoke antibacterial resistance;
- When making use of homeopathic or phytotherapeutic products, the farmer does not feel helpless but is able to do something, regardless whether it is appropriate or not;
- Farmers gain a positive image for some consumers if they do not use antibiotics.

Homeopathy is used for different reasons. One of the most mentioned reasons is the fact of that the use of homeopathic remedies does not causes resistance (Viksveen, 2003). Moreover, organic food-producing animals which were treated using chemically-synthesized allopathic veterinary medicinal products over 12 months (or more than one course of treatment if their productive lifecycle is less than one year) may not be sold as organic animals or products (European Commission, 2008). Another important reason is that a withdrawal period of zero days was determined for homeopathic remedies. This fact is particularly significant for organic farmers due to the fact that the withdrawal period is to be twice the legal withdrawal period, 48 hours where this period is not specified (European Commission, 2008). Furthermore the favourable price or the easy availability of homeopathic remedies and the increasing expectations of consumers concerning foodstuffs without antimicrobial residues have also contributed to an increase in the use of homeopathy in food-producing animals.

A recurring problem in homeopathy is that a representative proof of the efficacy of homeopathic remedies in agricultural practice has not so far been provided. An ongoing study showed that there is no standard procedure in the use of homeopathy and that treatment with homeopathic remedies is a very heterogeneous field (Doehring & Sundrum, 2015). This is mainly due to the fact that the homeopathic treatment is performed by different stakeholders: veterinarians, farmers and non-veterinary practitioner📖.

2 Objectives

In spite of possible advantages in the use of alternative treatments, non-professionals might often use remedies in inappropriate situations resulting in deterioration of animal health and animal welfare. Due to this, it is very necessary to examine the expertise of those using homeopathy as to whether they follow *lege-artis* methods and thus prevent potential misapplication of homeopathic remedies at the expense of animal health and animal welfare.

Appropriateness of homeopathic treatments is not only related to the effectiveness of the remedies themselves, which have to be proven in clinical control studies, but also depends on appropriate conditions on the farm level to a high degree. These include amongst others: expertise in formulating a profound anamnesis and diagnosis according to leading symptoms, availability of professionals with knowledge of alternative treatments, options for the appropriate application of remedies, and options checking and regulating the resultant effects on animal health status etc.

Hitherto there are no studies available in the literature providing information about the use of homeopathy in agricultural practice, thus the aim of the report is to provide an initial overview on the current situation on the use of homeopathy on organic dairy farms. Moreover, this document presents both the main drivers and barriers for veterinarians and to assess potential options for the improved application of homeopathic remedies.

3 What is homeopathy?

The term “homeopathy” is derived from the Greek words for "like" and "suffering" and it is a complementary and alternative or regulatory medicine which was developed by Samuel Hahnemann ((1755-1843), a German physician and philosopher) more than 200 years ago. This alternative treatment has a wide field of applications: acute and chronic diseases, infections, metabolic disorders, preventive health care and mental illnesses etc. Herbs and other plants, minerals, venom from snakes and other substances, can be used to make homeopathic remedies. Hahnemann developed three basic principles of homeopathy:

a) 1st principle: “similia similibus curentur” (“like cures like):

   This is the central rule of homeopathy and essentially means that a disease can be cured by a substance that produces similar symptoms in healthy people. For example an onion causes nasal or ocular discharge and is used in the treatment of acute rhinitis (runny nose).

b) 2nd principle: Homeopathic testing & principle of individualisation:

   An initial step in the similarity rule is testing of substances on healthy people. The resulting symptoms caused by the substances administered are compiled into a homeopathic “drug picture”. The most important characteristics of a remedy are determined as leading symptoms, which are summarised in “Materia Medica”. Treatments are “individualized” for each animal, thus it is not uncommon for different animals with the same disease or condition to receive different homeopathic remedies. There is no uniform prescribing standard. Hundreds of different homeopathic remedies exist, which can be prescribed in a variety of different dilutions for thousands of symptoms. Contrary to conventional treatment, the aim of a homeopathic consultation is to find the “totality of symptoms” on a physical and mental level. This closest match is called the “simillimum”.

c) 3rd principle: Potentiation - “law of minimum dose”:

Many homeopathic remedies are so diluted that no molecules of the original substance remain in order to reduce the harmful effects. While a substance in large doses causes certain symptoms, in small doses it can cure these same symptoms. Practitioners believe that the more a substance is diluted, the greater its power to treat diseases. The substance need to be shaken between each dilution in order to activate the properties of the homeopathic remedy. Homeopaths claim that water molecules can form a structure that contains physical information from the homeopathic drugs. Today, dilutions of 1:100 repeated 6 or 30 times are commonly used, but it goes up to 10,000 consecutive dilutions.

The effect of homeopathy is based on the principle of resonance. Homeopathic remedies aim to use the body's own healing mechanisms and stimulate the body's ability to heal. The body of the diseased animal reacts both to the homeopathic remedy and (simultaneously) to the symptoms of the corresponding disease. However, the medicine will not work where animals receive a homeopathic remedy that does not match their symptoms.

4 Material and methodology

4.1 Selection of farms

The study focussed on three European countries: France, Germany and Spain, where homeopathy is more or less frequently used in farm practice. Those organic farms, which have already participated in investigations in Workpackage 2 and were identified to make use of homeopathy were considered in priority because background information about the livestock production was already available and the cooperation with the farmers has proved its worth. In order to meet the envisaged number of 20 farms in each country, additionally an internet search was carried out. Those organic farmers who announced on their homepage that they make use of homeopathy were called and asked for their preparedness to participate.

4.2 Elaboration of questionnaires

In order to provide an overview of the current use of homeopathy on dairy farms, following five different questionnaires were developed by scientists and veterinarians who, are experienced in homeopathy and work for the International Association for Veterinary Homeopathy (IAVH). The responsibility for these different questionnaires was assigned to scientists or homeopathic experts according to their expertise (see notes in brackets):

1. Questionnaire on farmers‘ background (scientists);
2. Questionnaire about farm management (scientists);
3. Questionnaire on the use of homeopathy by farmers (IAVH-Experts);
4. Questionnaire on the use of homeopathy by veterinarians (IAVH-Experts);
5. Questionnaire for veterinarians who are not familiar with homeopathy (scientists).

The formulation and finalization of the questionnaires was conducted in different phases. After the development of the first drafts, an optimisation phase took place. The starting point of the optimisation process was a two-day workshop with all workpackage partners (scientists and homeopathic experts) from Spain, France and Germany in Frankfurt in September 2014. The aim of the first day was to clarify unclear or open questions and to modify the structure of the questions and the questionnaires in order to make them easier to follow and less time-consuming. On the second day, a pilot test of the reworked questionnaires took place on an organic dairy farm in

Germany. Immediately after the interview session, a second round of modification of questionnaires No. 1 to 4 was performed. To ensure a smooth applicability of the questionnaires, a final testing under the conditions of farm practice was performed by scientists in each participating country resulting in the questionnaires' final version. Finally in order to guarantee every question was clear to the respondents, all questionnaires were translated into the national languages by scientists. In order to keep the questionnaires as short and practicable as possible, scientists and homeopathic experts were tempted to focus on the main possible options for response in each question.

4.2.1 Questionnaire on farmers' background

This questionnaire (see annex I) serves for a query of information regarding the background of the user of homeopathy and provided information about the individual farm situation. The aim of this questionnaire was to identify information of the user, e. g. age, gender, school or agricultural education etc. For gathering information about the individual farm situation, questions about type of housing, involvement in associations/groups, cow genetics, access to outdoor run/pasture or involuntary culling etc. were applied.

4.2.2 Questionnaire about farm management

This questionnaire (see annex II) consisted of two parts and was used for querying the individual farm situation, among others regarding the management, the diagnostic procedure in case of suspicion for a disease, and the success control after a treatment. Part one was particularly designed for the inspection of the housing conditions (options for tying animals up, boxes for diseased or calving animals), the storage environment for remedies and stockpiling while performing a stable tour. Second part of the questionnaire was divided into four different sections and focussed on the management situation, e.g. evaluation of milk records, performance of animal observation, Body Condition Scoring (BSC) and California Mastitis Test (CMT). To obtain additional information about the users of homeopathy and the reasons for them to treat the farm animals with homeopathic remedies, questions about personal attitudes towards homeopathic and conventional treatment were included as well. Farmers needed to indicate how strongly they agreed or disagreed with each statement on a 5-point-likert scale from 1 (agree strongly) to 5 (disagree strongly).

4.2.3 Questionnaire for the use of homeopathy by farmers and by veterinarians

The procedure of the homeopathic treatment by farmers and veterinarians were examined by means of a questionnaire (see annex III) which was divided into ten different parts:

1. Education and expertise;
2. Anamnesis;
3. Diagnosis;
4. Selection and application of remedies;
5. Availability of remedies;
6. Use of remedies;
7. Specific cases of treatment;
8. Control of success;
9. Documentation;
10. Conclusion:

All the above mentioned categories serve for description of different application procedures of homeopathic remedies on farms in agriculture practice. Farmers and veterinarians were interviewed by the same questionnaire. Difference referred solely to the number of interview questions; farmers

additionally had to answer questions about the consultation of a professional. Each part of the questionnaire was finalized with a ranking by which the homeopathic experts evaluated the current users' level of awareness of the principles of homeopathy on a scale from 1 (very good) to 5 (very poor).

4.2.4 Questionnaire for veterinarians who are not familiar with homeopathy

The intention with developing this questionnaire (see annex IV) was to gather information about the perspectives of veterinarians not familiar with homeopathy in order to identify possible constraints for the use of homeopathy in agricultural practice.

In the first place, all local veterinarians of the farms involved in WP4 farms and stated that they never or currently do not use homeopathy to treat farm animals received this questionnaire. To achieve a higher number of responses, additional veterinarians which were randomly identified by an internet search were included in the survey. The veterinarians' homepages contained no reference to homeopathic treatment. The questionnaire contained questions concerning homeopathic education, previous applications of homeopathic remedies and reasons for or against making use of homeopathy. The questionnaire was sent to 40 veterinarians in each country. In order to receive honest responses, the questionnaire was sent anonymously. Due to a lack of feedback, a reminder was sent after two to three weeks. Finally, 41 out of 49 responses could be included in the evaluation.

4.3 Farm visits

Farm visits served for applying the questionnaires and to gather information about homeopathic treatment procedures on farms. It was assumed that the use of homeopathy would differ considerably from farm to farm. Therefore, it was intended to visit at least 20 farms in each country. In total, 64 farm visits (20 in Germany and France, and 24 in Spain) took place in collaboration with the farmers, the homeopathic experts from IAVH and the local veterinarians. The following criteria in descending order were determined for the identification of interview candidates:

1. Farmers needed to have used homeopathy for at least one year;
2. Milk recordings needed to be available;
3. In case not enough organic farms could be found, it was allowed to recruit conventional farms.

To ensure the comparability of the data, the same procedure during the farm visit had to be adhered to, beginning with the stable tour and inspection of stable pharmacy followed by the interview session with farmers questioned by scientists and homeopathic experts.

4.4 Evaluation of the questionnaires

All answers of the respondents were recorded in the online survey tool "Limesurvey". After the completion of the data recording, one excel file per questionnaire was extracted from "Limesurvey". Every question was evaluated individually by a scientist and was assigned to different categories like prophylaxis, early detection of diseases or *lege-artis* steps of a homeopathic treatment identified in WP9. For the purpose of the evaluation, different methods were used for the analysis, of the respective question, depending on: frequency distribution with or without previous categorisation and a ranking method (see detailed description in chapter 5.1.3 "culling reasons" and 5.3.2.4 "milk recordings"). Only few questions were not analysed due to a high heterogeneity or incompleteness of the responses/data.

By the use of the Theory of Planned Behaviour (TPB), it was intended to generate predictions concerning the probable use of homeopathy by opponents in the future. In the context of homeopathic treatment, it is of interest to identify the differential influence of attitudes (to the use of homeopathy), normative referents (opinions of peers) and perceived behavioural control perceptions, as well as socio-demographic characteristics on the behavioural intention of veterinarians (i.e. intent to use homeopathy in the next 12 months). Additionally, it is important to assess the cognitive drivers and barriers to the development of intention to use homeopathy amongst this group, together with the rationale supporting those drivers that were identified as influential is important to assess.

The specific analytical framework of the Theory of Planned Behaviour (TPB) (Azjen and Fishbein, 1980; Azjen, 1985, 1991) was used for the analysis to explore the intention of veterinarians to use homeopathy with their clients in future. TPB was chosen as an analytical framework in this case because expressed intention is the only guide to future behaviour available. This behavioural model states that a person's 'intention' to perform a particular behaviour is the best predictor of whether they will actually do so. The model identifies three determinants that influence the intention to perform a particular behaviour:

1. the attitude of an agent towards the expected outcome of the behaviour (Outcome Attitudes);
2. an agent's beliefs about what valued peers expect them to do in relation to the behaviour (Subjective norms); and
3. an agent's beliefs about their own ability to implement the behaviour (Perceived Behavioural Control).

TPB suggests that, as shown in in Figure 24, more favourable attitudes towards the outcomes of the behaviour, the more favourable the opinions of valued peers towards the behaviour, and the greater the perceived behavioural control, the greater the likely intention to perform the behaviour.

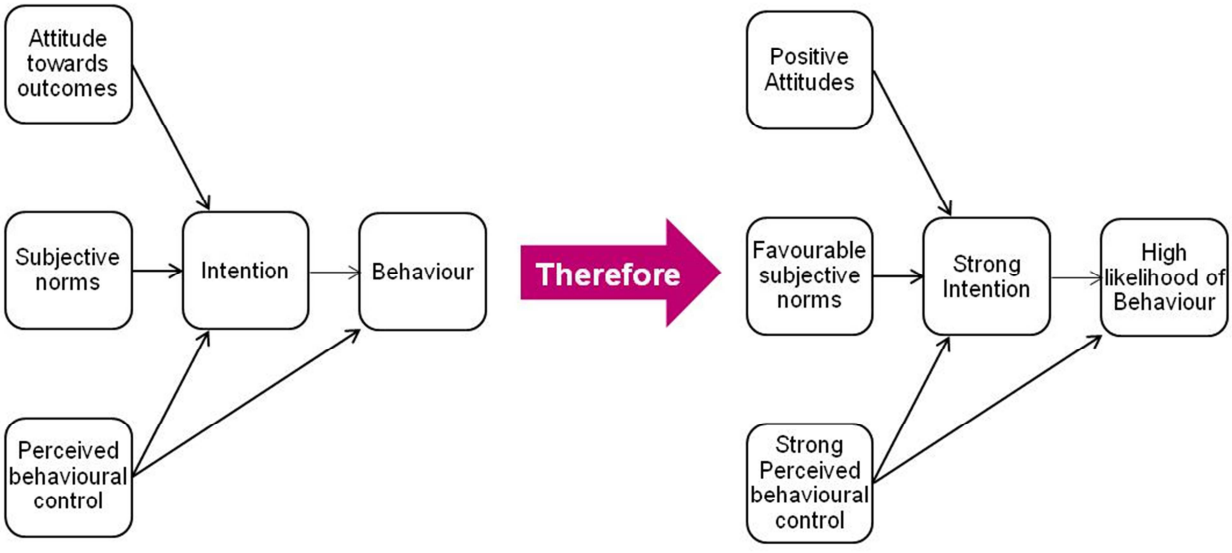

Figure 1: Theory of planned behaviour – "Behavioural model"

TPB has been used to explain human behaviour in a wide variety of fields of human endeavour, including, farmer behaviours, for example in the context of organic farming (Läpple and Kelley, 2013) and farmer and veterinarian attitudes to control of livestock diseases (Alarcon et al., 2014; Jones et al., 2015) including mastitis control (Lind et al., 2012).

5 Results

5.1 Description of dairy farms

5.1.1 Locations of farms and type of housing

The regional distribution of the farms visited (see Figure 2) was influenced by factors such as climatic conditions, dissemination of homeopathic treatment and readiness of farmers to participate. In Germany and Spain, it was difficult to convince farmers to participate in this project. In order to meet the required number of twenty farms which make use of homeopathic products, five conventional farms in Germany and 10 in Spain were included. The main problem in the recruitment of participants was due to the fact that a lot of farmers were worried about the publication of a report addressing the “illegal use” of homeopathic remedies in farm practice. Some farmers stated that they were afraid of a possible tightening of legal regulations for the use of homeopathy if a report makes their situation public. In Spain, the long distances between organic farms were also a decisive factor for including conventional farms.

In France it was possible to study organic dairy farms alone. In France, dairy production is located primarily in the North-West of the country. As homeopathic treatment is widespread amongst French farmers, it was not difficult to recruit the farms.

The regional distribution of Spanish dairy farms depends primarily on the climatic conditions. The most productive agricultural areas are located in coastal regions, especially in the North and the Northwest of Spain (Asturias, Galicia, Basque region and Cantabria). These regions provide suitable climatic conditions and pastures for dairy livestock.

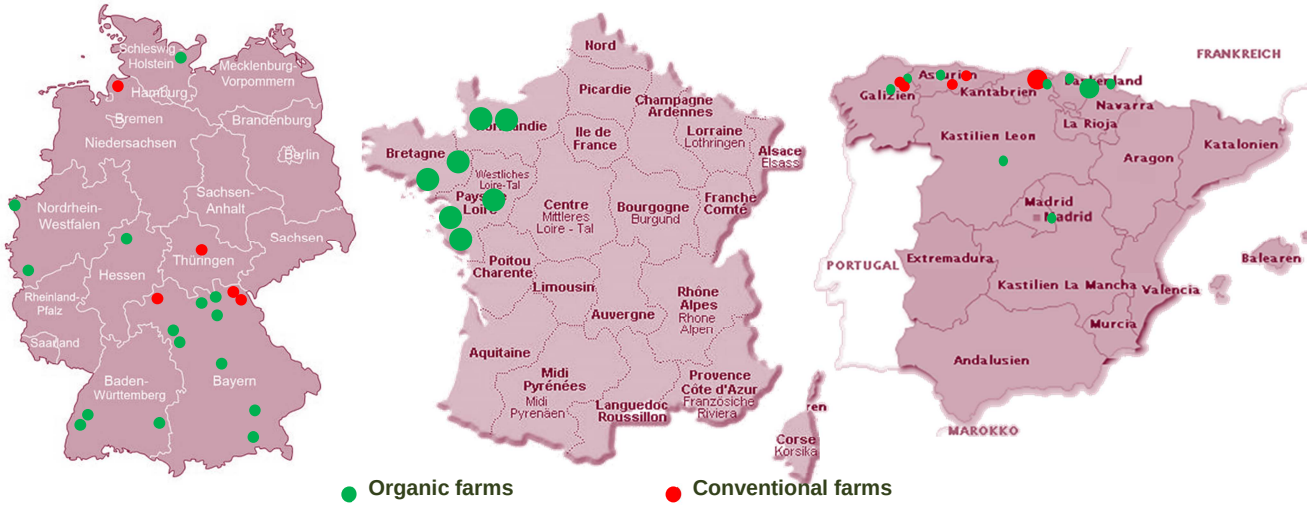

Figure 2: Location of dairy farms (from left to right: Germany, France and Spain)

5.1.2 Cow genetics

In total, sixteen different breeds were found on the dairy farms in the three countries, among them well-known breeds like Holstein, Fleckvieh/Simmental and Jersey, but also less familiar ones (e.g. Roja Pasiega, Asturian Montaña, Triesdorfer Tiger etc.) and a lot of crossbreeds. The farmers were asked about the predominant breed on their farm (see Figure 3). The Holstein breed was present in approximately 90% of the farms in Spain and France. In Germany, the breed ranked in second position. In more than half of all German farms Fleckvieh/Simmental was favoured. It must, however, be added that the use of Holstein or Fleckvieh/Simmental in Germany depends on regional preferences, e.g. farmers in the South prefer Fleckvieh/Simmental and the ones in the

North use Holstein more often. Since it was easier to convince more farmers in the South than in the North of Germany to take part, an unbalanced distribution of genotypes appeared in this study.

Figure 3: Distribution of predominant breeds

5.1.3 Culling reasons

The first step in ascertaining the animal health status on the dairy farms was querying the most frequent reasons for involuntary culling. Farmers were asked to rank the most frequent diseases in descending order which led to an early removal from the farm. The following rating system was applied: rank 1 = 3 points, rank 2 =2 points and rank 3 = 1 point. The sum of all points determined the ranking position of a disease. The category “others” included high age, accidents, bad character trait and low-milk production. The evaluation of the ranking showed the following results (see Table 1): the most commonly named reason for involuntary culling was udder diseases (mastitis), followed by fertility disorders or other diseases in the second and third place. Mastitis and fertility disorders were the main health problems in Germany and France. In contrast, Spanish farmers stated high age of cows and accidents (“other diseases”) as the main cause for involuntary culling.

Table 1: Ranking of reasons for involuntary culling

	Germany Disease	Points	France Disease	Points	Spain Disease	Points
Rank 1	Udder diseases	36	Udder diseases	46	Other	39
Rank 2	Fertility disorders	33	Fertility disorders	37	Udder diseases Fertility disorders	32 32
Rank 3	Claw diseases	25	Claw diseases	11	Claw diseases	15

5.2 Description of the user of homeopathy

5.2.1 Gender and age distribution of farmers

The gender of farmers revealed a sex ratio of two-thirds men to one-third women in Germany and France (35% ♀, 65% ♂). In Spain, there was an even greater imbalance between women and men (25% ♀, 75% ♂). Nearly 50% of the farmers who regularly make use of homeopathy were on average 45-54 years old. A lot of farmers mentioned that a main reason employing homeopathic treatments was that their children were treated with homeopathy and they recognised that homeopathy really could work.

5.2.2 Farmers' education

The evaluation of questions on school education showed a highly heterogeneous situation: All farmers interviewed in France went to school for 12 years and most of them had vocational education after school. In Germany and Spain, the duration and the level of school education was highly diversified and ranged between 9-13 years (Germany) or 6-12 years (Spain). In general, the majority of the farmers had a vocational education qualification. Higher education on a university level was something of a rarity (see Figure 4). The results indicate that the use of homeopathy is not restricted to a particular group of non-educated or educated people.

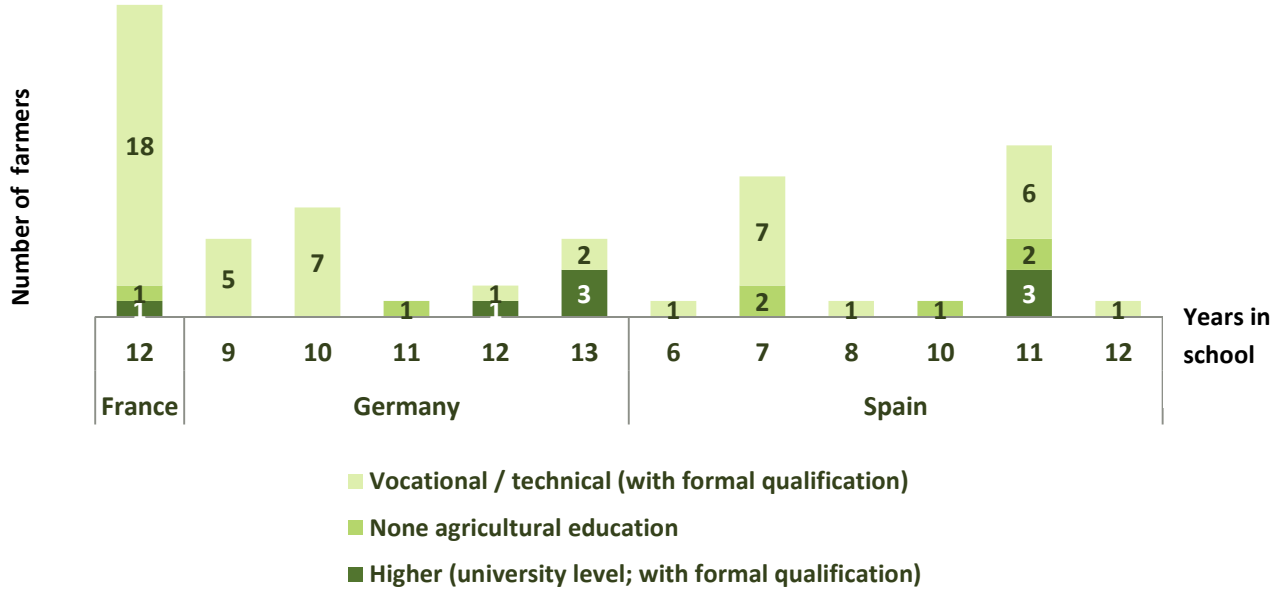

Figure 4: Farmer's education

5.2.3 Farmers' associations

Furthermore, organic farmers were asked whether they were members of an organic association. The results revealed that 17 of 20 farmers (85%) in France, 15 of 15 farmers (100%) in Germany and 7 of 14 farmers (50%) in Spain were members of an organic association.

5.2.4 Homeopathic education and expertise of farmers

The questionnaires developed concerning the current use of homeopathy contained various questions on homeopathic education and awareness of principles of homeopathy and examined the users' homeopathic expertise level.

As was expected, a heterogeneous situation regarding experience with homeopathic products was found. Initially, the responders were asked how long they had been using homeopathy to treat diseased animals. The majority of the farmers had used homeopathy for more than one year or more than 10 years. However, there was a wide variation within the countries (see Table 2). Furthermore, a total number of 11 veterinarians was involved in the assessment of homeopathic treatment process on farms. Due to the small sample size only the evaluation concerning the use of homeopathy by farmers was considered.

Table 2: Previous application period of homeopathic remedies (Number of farmers)

Duration of application	Germany	France	Spain
< 1 year	-	1	-
More than 1 year	2	4	15
More than 5 year	6	6	4
More than 10 year	12	9	5

The following questions dealt with basic training in the field of homeopathy in order to gain insights into the quality and the duration of the homeopathic training courses. Farmers were asked what kind of basic training courses they had participated at. One or multiple answers to this question were allowed, whereas only the most extensive training course was selected for the evaluation. About 40% of the farmers stated that they had not joined a specific education course but had taught themselves to use homeopathy by books or internet etc. 10% of the farmers participated in part time education courses over different periods of time (from 1 day to more than 2 days). In total, 29 (45%) farmers (mostly from France) had done full time education courses lasting from one day to one week. Especially in Spain, more than 70% of farmer who make use of homeopathic remedies had no basic education in homeopathy. Only three Spanish farmers had received a part-time or full-time basic training course from a professional (see Figure 5). In 77% of the cases, farmers were trained by a homeopathic veterinarian. However, more than half of the German farmers (53%) who participated in a part time or full time training course were educated in homeopathy by a non-veterinary practitioner.

Not only is basic education important; ongoing education in homeopathy is also a key aspect. For this reason, the interview partners who received a professional basic education (part- or full-time courses) were asked how many further training courses they had attended in the last three years (see Table 3). In total, 10 French farmers and 11 Germans had attended in further training courses in the last three years, but the quantity of courses varied from one course to more than five courses. Spanish farmers attached less importance to further training courses; only three of 24 farmers had participated in these courses.

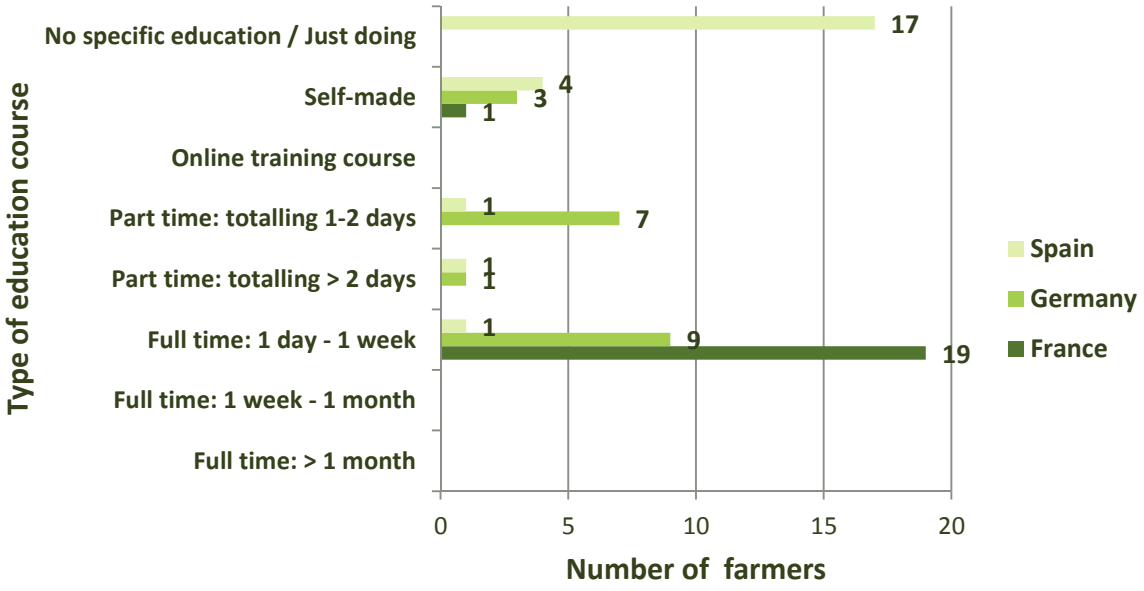

Figure 5: Farmers' basic education in homeopathy

Table 3: Number of farmers who participated in further training courses in the last three years

	Germany	France	Spain
1 course	**-**	**2**	**2**
2-3 courses	**4**	**5**	**1**
4-5 courses	**2**	**1**	**-**
More than 5 courses	**5**	**2**	**-**
None in last 3 years	**9**	**10**	**21**
Overall participation in %	**55%**	**50%**	**13%**

In conclusion, a ranking from “Very Good” to “Very Poor” (Figure 6) concerning experience and expertise in the use of homeopathy was cited by the homeopathic experts. The individual evaluation was based on the data collected and additional responses by the interview partner to specific questions. In general, farmers in France seemed to be better educated in the use of homeopathy than Spanish and German ones. Only 25% of the farmers in France and Germany achieved a “Good” score and not even one in Spain. The score “Very Good” was not awarded.

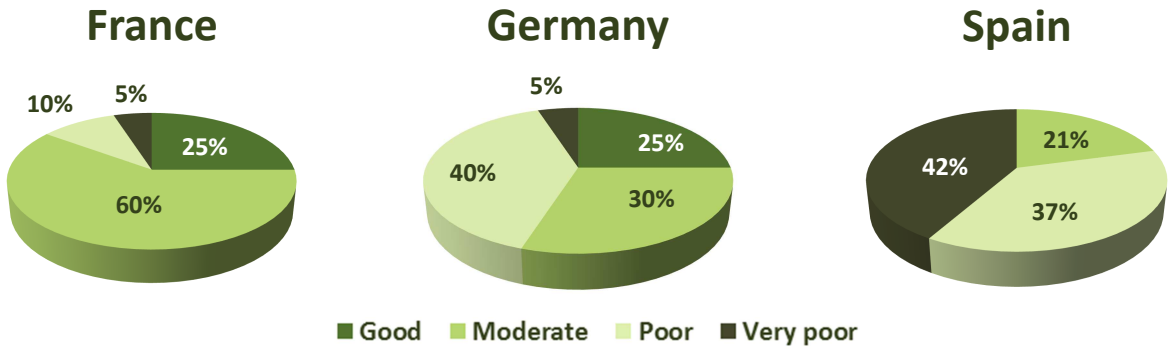

Figure 6: Ranking of farmers’ basic education in homeopathy

5.3 Identification of prerequisites

The appropriateness of homeopathic treatments depends to a high degree on the presence of prerequisites in relation to treatment on farm level. Three different categories of prerequisites were identified beforehand:

1. Structural conditions,
2. Non-Structural conditions,
3. *Lege-artis* use of homeopathy.

Questions in all four questionnaires were assigned to these three categories, depending on the content of the questions.

5.3.1 Structural conditions

During the farm visits, the scientists also focused on structural preconditions such as options for tying animals up, separate boxes for diseased animals and the storage conditions in the of stable pharmacy, since these factors might have an influence on the treatment success.

5.3.1.1 Options for tying animals up

Options for tying animals up are important for any medical treatment especially for homeopathy. Thus there are certain guidelines or procedures for the administration of homeopathic remedies

given in the Organon of medicine (Hahnemann & Haehl, 2004). For the efficacy of homeopathic remedies, it is essential that the substances have contact with the animals' mucosa. Hahnemann (2004) instructed that the tongue, mouth and stomach are the most effective routes of administration of remedies. According to homeopathic professionals, it does not make a difference whether pure homeopathic globules are given by oral, vaginal or olfaction method, or whether they are dissolved in water and sprayed directly into nose, mouth or eyes etc. In Germany the administration of homeopathic substances in the form of injections are very popular.

Based on the fact that homeopathic remedies are absorbed through the mucous membrane, care should be taken that shortly before or shortly after a drug administration no food intake by animals takes place, since the remedy will be less effective. Furthermore, users of homeopathy need to be careful that they do not touch the remedy. This may change or neutralize the remedy. For these reasons, it is necessary to tie animals up securely in order to ensure the correct administration of homeopathic remedies. In case of non-tied up animals, it is very likely that the guidelines for the administration route are not always correctly applied in agricultural practice.

The results showed that all farmers, except one Spanish farmer, were able to securely tie up animals on farms, in different ways. Almost all farmers (84%) tied animals up by using feed fences and 11 of them could also make use of tether rope if necessary. Three French farmers even had access to a treatment stand. The remaining six farmers used other ways of securing animals, like milking parlours or treatment gates.

5.3.1.2 Options to separate diseased animals

Having good options for the separation of diseased animals aids the success of homeopathic or conventional treatment. On the one hand, the detection of symptoms - especially homeopathic symptoms - is easier to perform in separate boxes than in loose stalls where other animals can create disturbance. Moreover, a separation of diseased animals minimizes the risk that pathogens are spread amongst the other animals and thus serves as a preventive measure. For these reasons, the scientists also studied the options for separating diseased animals. A total of 15 farmers stated that no boxes for diseased animals were available on the farm. 35 out of the 64 farms used the same boxes both for diseased as well as for calving animals. In this case, the risk of transmission of pathogens is particularly high in the absence of appropriate hygiene management. Only 14 farmers (5 in France and 9 in Germany) stated that separate boxes for diseased and for calving animals were available.

5.3.1.3 Stable pharmacy

Concerning the storage of homeopathic remedies, some features must be taken into consideration. After an intensive investigation of literature (Erkens, 2006; MacLeod, 1985; Gnadl, 2011) the following specific storage instructions have been identified:

a) Store remedies in a cool and dry location;
b) Do not expose remedies directly to sunlight;
c) Do not place the remedies near strong odours (e.g. camphor, peppermint, carbolic acid etc.);
d) Keep remedies away from any radiation source (e.g. telephone, refrigerator, microwave, electricity service box etc.).

With these specific storage instructions for homeopathic remedies in mind, the storage conditions for remedies on every farm were also inspected. General recommendations for pharmacies in stable state that veterinary medicinal products (homeopathic or conventional) should be stored in a separate room. Only 28 of 64 farms met this recommendation. This separate room is often used as the stables' office, equipped with several electrical devices like a telephone, refrigerator or electricity

junction boxes etc. Electrical devices have been found to emit electromagnetic waves, which might have a negative influence on the efficacy of homeopathic remedies. Almost all farmers are aware of this fact; only 9 farmers stored homeopathic remedies near electrical devices. The most well-known recommendation for storage of both homeopathic and conventional remedies is “store remedies in a cool, dry and dark location”. The majority of farmers (44 people) followed this recommendation. However, on most farms homeopathic products were not stored in a refrigerator. Thus the assessment concerning the cool storage is thus of a subjective nature and depends on the outdoor temperature/season (farm visits mainly took place from January to April). Storing homeopathic remedies next to products with strong odours (often containing camphor or peppermint etc.) took place on 5 of 64 farms and hence these farmers might have risked a decrease in the efficacy of stored homeopathic remedies. Furthermore, it was noted that half of the farms stored homeopathic remedies beyond their best-before-date. To sum up, it can be concluded that a total of 39 farms (Spain: 6, France: 20 and Germany: 11) met the above-mentioned storage recommendations for homeopathic remedies.

Storage conditions for conventional veterinary products were checked at the same time, according to the current recommendations for their storage (dry, dark and cool). Only 33 farms met the recommendations for adequate storage of their medicinal products. A total of 22 farms stored medicines which were past their expiry date. In general, it is strongly recommended not to use expired conventional products for treatment as the effectiveness of medicines cannot be ensured.

5.3.2 Non-structural conditions

There is a range of prerequisites inter alia non-structural conditions. These include hygiene management, preventive health care, nutritional status, early detection of diseases and animal observation. These factors might also have an influence on both the treatment success and the homeopathic remedy itself.

5.3.2.1 Hygiene management

Appropriate hygiene management is essential for disease prevention, since the transmission of pathogens to healthy animals can be prevented by comprehensive hygiene measures. It is thus not only the separation of diseased animals that can contribute to preventive health care, but also appropriate cleaning and disinfection measures of separate boxes. Farmers were therefore asked to describe their hygiene management of separation boxes.

Although approximately one third of all farmers made use of separate boxes for both diseased and calving animals (meaning that the risk for transmission of pathogens was particularly high) only inadequate cleaning and disinfection measures were applied: boxes were only cleaned rarely on 21 of 22 farms which used the same boxes for diseased and calving animals. Only one farmer cleaned the shared boxes with a hot water high pressure cleaner (min. 65℃). Amongst the 22 farmers mentioned, 15 of them had an extremely high risk for dissemination of diseases, as they did not use any kind of disinfection measures. At least 6 farmers used lime at regular intervals and 1 farmer used primary rocks-powder in addition in order to prevent transmission of disease.

5.3.2.2 Preventive health care

Due to their high milk production during the lactating phase, cows should have an opportunity to regenerate the mammary tissue in their dry period. Although the cows are not being milked, the udders can get infected. After drying off and immediately before calving, the risk for an infection increases dramatically (Dingwell et al., 2004). In order to minimise the incidence of mastitis after

calving different drying-off methods are used in farm practice, inter alia: drying-off with conventional or homeopathic remedies.

Farmers were thus asked to indicate what kind of drying-off method (conventional or homeopathic) they used (see Figure 7). The survey revealed that the single use of antibiotic udder injectors was still the most frequently used drying-off method. However, antibiotic drying-off products were not used as a routinely; only for selected animals. More than two-third of all farmers stated a high somatic cell count as a reason for selective antibiotic use at drying-off. 15% of farmers who made use of antibiotic products for drying-off mentioned “other” reasons (e.g. high milk production, cows with known high risk of mastitis after calving, animals that have already received antibiotic udder injectors in the past or use of antibiotic products mainly in winter due to the closed indoor environment (increased risk of infection, etc.).

Purely homeopathic drying-off management was rarely applied (14% of all farms) on farms in Germany, France and Spain. If so, it was only administered to selected animals. The three most-named reasons for selective use of homeopathic drying-off remedies were:

- “other” (46%): high milk production, age-related changes in the udder;
- High somatic cell count (31%);
- Change of milk (15%).

Regarding the use of antibiotic or homeopathic drying-off products, there was barely any difference between Spain, Germany and France.

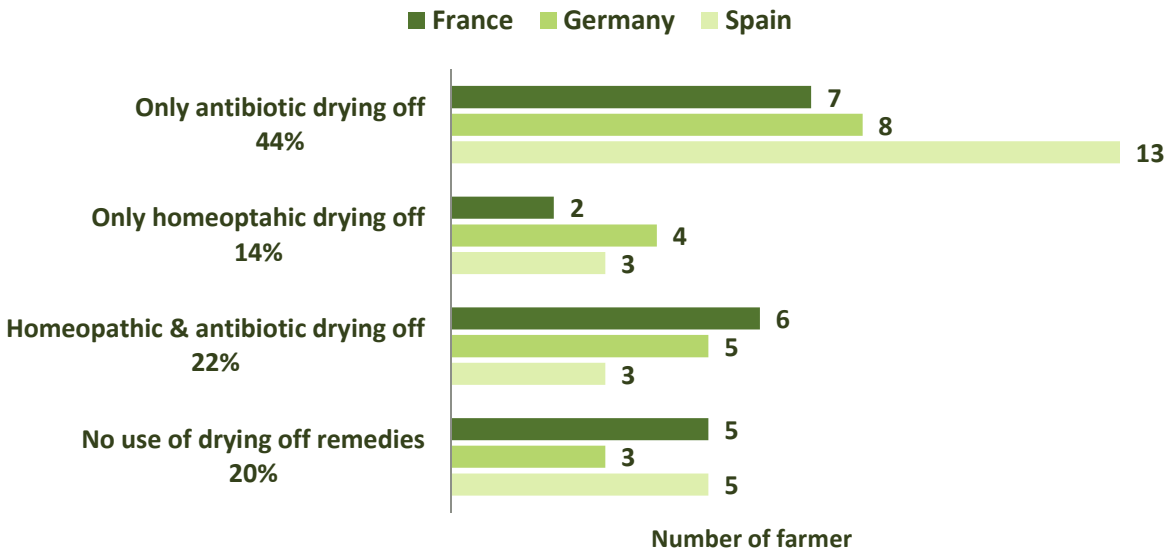

Figure 7: Use of drying-off products

5.3.2.3 Nutritional status

It can be expected that imbalanced nutrient supply has a negative influence on the regenerative capacity of diseased animals. According to the principle of homeopathy only a reactive body can respond to a homeopathic remedy. In the case of an under- or oversupply of nutrients resulting in a metabolic disorder, the body of diseased animals has no adequate capacity to react. This can be avoided by close control of feed rations and regular consultation with a professional nutritionist. For this reason, respondents were asked a series of questions concerning animal nutrition and milk records. Farmers were thus asked for the frequency of consultations with a nutritionist. Almost 50% of all farmers (15 in France, 12 in Spain and 4 Germany) never consulted a nutritionist, just 15 out of 64 farmers consulted a professional feed adviser quarterly. In total, 8 farmers consulted a

professional feed adviser 12 times a year and one farmer was a nutritionist and managed the nutritional situation by himself.

5.3.2.4 Early detection of diseases

Monitoring measurements

Results from milk records are not the only indicator of a possible risk for the development of diseases. Other monitoring measurements like Body Condition Scoring (BCS) and use of pedometers etc., are also useful. Therefore, the presence of other monitoring measurements available and used on the farms was investigated. The following diagram (see Figure 8) shows the use of different equipment for early detection of disease on farms in Spain, Germany and France (multiple answers permitted). German farmers in particular used monitoring measurements very frequently; namely more than twice as much as farmers in France. The most frequently used monitoring measurements in the field of early detection were the California Mastitis Test (CMT). The category "other" included olfactory test of milk, somatic cell electronic counter, duration for milking process through milking system and regular information about urea (eight times per month) and SCC (four times per month) via a short messages system (SMS).

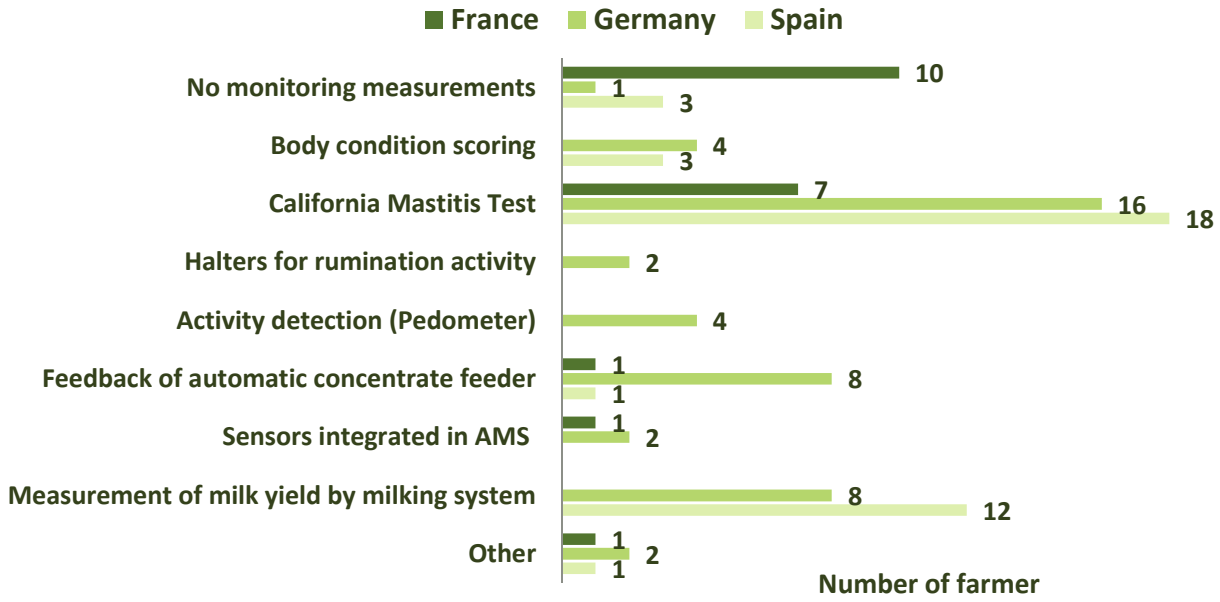

Figure 8: Use of monitoring measurements on farms (multiple answers were permitted)

In general, approximately 80% of all farmers reflect 1-10 minutes a day on the data provided by monitoring records. Only few farmers invested more time per day for analysing monitoring records: 9% [11-20min], 6% [21-30min] and 5% of all farmers [more than 40min].

Milk recordings

Milk recordings may provide information concerning udder health if somatic cell counts are measured, but may also give an indication on the nutritional status of dairy animals; the evaluation of the fat-protein ratio and the urea content of the milk is one useful method. Therefore, the way milk records were analysed was also addressed during the farm visits. Milk records were available on 58 of 64 farms: 15/20 in France, 20/20 in Germany and 23/24 in Spain. An evaluation of individual or detailed milk record data was performed by 85% of the farmers who keep milk recordings. In order to find out which information was most important to farmers in the milk records, a ranking from 1 to 3 according to the order of answers given was performed (see Table 4). Using the aforementioned

evaluation method (see 5.1.4. reasons for involuntary culling) for ranking (rank 1 = 5 points, rank 2 = 4 points and rank 3 = 3 points), the most important data for farmers in milk records are ranked and presented as follows.

Table 4: Ranking of most important data in the milk recordings

	France	Germany	Spain
Rank1	Somatic cell count in general		
Rank2	Milk components (fat, protein and urea)		
Rank3	Somatic cell count before drying off	Milk yield / course of lactation	

In general, farmers in the three countries did not differ in the way how they attach importance to the data of the milk recordings; all farmers looked first for the average number of the somatic cell counts and then for milk components. A difference only occurred in the third rank, the somatic cell count before drying off was more important for French farmers than for German and Spain ones. Milk yield and course of lactation played a minor role for farmers in Germany and France. However, for Spanish farmers these data were more or less essential for the daily farm routine.

Somatic cell count

Somatic cell count (SCC) is generally the most frequently used indicator for udder health in dairy cows and is used to determine whether an individual animal or an udder quarter is infected. Currently, there are various thresholds concerning udder health which vary between countries and circumstances available. In uninfected glands, the SCC range is between 10,000-70,000 cells per ml of milk and thus below 100,000 cells per ml (IDF, 2013). Above the threshold of 200,000 cells/ml (cow level which is used in practice) or 100,000 cells/ml (quarter level, which may be used for research purposes) it is very likely that the udder is infected resulting in clinical or subclinical mastitis. Based on the “Guidelines for the use and interpretation of bovine milk somatic cell counts (SCC) in the dairy industry” from the International Dairy Federation, the national threshold for Germany has been determined by DVG (German Veterinary Association) to the value of 100,000 cells per ml (Fehlings, 2012). Since the SCC is an indicator for udder health, farmers were asked about the SCC threshold where they would run mastitis treatment. For the evaluation of farmers’ responses, the value of 100,000 cells/ml was used.

Result from this survey demonstrated how strongly the SCC threshold differs from farmer to farmer and country to country. Only two farmers ran a treatment when SCC was above the value of 100,000 cells/ml. Approximately 40% of all farmers reacted in the case of a SCC from 200,000 cells/ml upwards, whereas nearly 45% would take treatment into consideration when SCC was above 300,000 cells per ml of milk. Furthermore, three respondents stated that they do not begin a mastitis treatment until SCC is greater than 400,000 cells/ml. It can be assumed that a subclinical mastitis (high SCC without clinical symptoms) is at a high risk to develop into a chronic disease due to a delayed start of the treatment, thus making it more difficult to treat mastitis successfully whatever the choice of treatment strategy.

Body condition score

Body condition scoring is a tool to help assess the nutritional status of dairy cows. It provides an indication of the amount of fat and muscle layers covering the bones. Farmers were asked whether they performed a BCS, and if yes how the BCS was carried out. The results of the survey have shown that only 9 of 64 farmers (6 in Germany and 3 in Spain) performed a regular body condition

scoring; furthermore, BCS was not used by any farmer in France. For early detection of sudden changes in body condition, it is important to perform a BCS at two different points of lactation: ante partum (end of drying-off) and post-partum (after calving). The following Table 5 illustrates how many animals were subject to regular body condition scoring by farmers before or after calving.

Table 5: Performance of BCS

	Number of farmer		
	France	**Germany**	**Spain**
Ante partum (end of drying off)	0	All animals: 2 Only selected animals: 2	All animals: 1
Post-partum (first 6 weeks after calving)	0	All animals: 3 Only selected animals: 1	All animals: 2 Only selected animals: 1

Furthermore, not even 50% of farmers who performed BCS documented the results regularly. The lack of documentation leads to the assumption that despite a regular BCS, a slow or slight change of body condition would not be noticed by farmers and the required modification of the diet could be implemented too late to attain appropriate nutritional status for the next lactation period.

Hoof trimming

Through regular trimming of cows' claws, claw diseases can be detected early and promptly treated. Hoof monitoring can minimize the number of animal losses due to claw disorders, improve recovery, and reduce animal suffering. It is recommended that claws are trimmed at least once a year. The ideal times would be once at dry off and again at around 100 days in milk. Furthermore, good documentation is key to monitoring a cow's condition as well (Ishler et al., 2001). In doing so, possible reasons for a higher risk of claw disorders on the farm level, e.g. inadequate nutrition and feeding management or infrequent hoof trimming can be identified and the management can be modified accordingly. In all three countries, a very heterogeneous picture of hoof monitoring or routine hoof trimming emerged (see Figure 9). In Germany, nearly three quarters of participating farmers trimmed the claws of all animals at least once a year and those of lame cows as well. French and Spanish farmers preferred mainly the individual treatment; only lame cows were subject to hoof trimming. In these two countries, there was a considerable number of farmers who did not undertake routine hoof monitoring by trimming the claws.

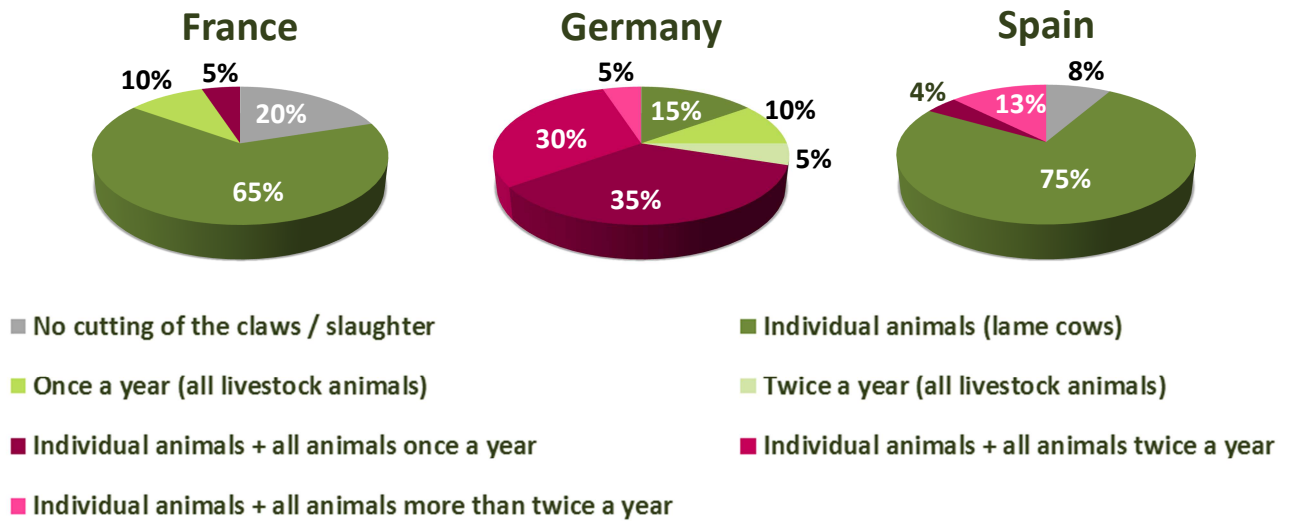

Figure 9: Hoof monitoring / Trimming the claws

Only 11 of 58 farmers regularly performing routine trimming of claws documented this properly. The lack of documentation increases the likelihood of overlooking early stages of claw disease.

Fertility test

The detection of heat is important since it allows early identification of fertility disorders. Various options or technical equipment are available to perform fertility test. Farmers were asked to indicate what kind of means for heat detection they used and how many animals were checked by the farmers each time (multiple answers were permitted). The following table gives the results of the evaluation.

Table 6: Measurements for heat detection

	No. of farmer in France		No. of farmer in Germany		No. of farmer in Spain	
	Only selected animals	All animals	Only selected animals	All animals	Only selected animals	All animals
Visual oestral observation	1	19	1	19	9	15
Activity detection	-	-	1	3	-	-
Mount detection	-	-	-	-	-	-
Milk progesterone test	-	-	-	-	-	-
Oestral / heat calendar	1	16	7	9	5	6
Index card system	-	2	1	1	-	-
Breeding bull	2	-	5	2	3	-

Visual observation was the most widely used observation method followed by individual heat calendar. Very few farmers used modern technology like activity detection (pedometer) or herd management software. It can be concluded that there was ample room for improvement in the field of heat detection.

Furthermore, it is not only the detection of heat that plays a role in fertility, but vaginal observation after calving as well. After calving puerperal problems, such as retained placenta, acute metritis and abnormal vaginal discharge still often occurs. Such diseases have a negative effect on fertility, thus treatment at an early stage is necessary. For that reason, farmers were asked in what way and by whom a vaginal observation (within 6 weeks after calving) was performed. Almost all farmers in Spain (96%) and Germany (95%) performed a regularly vaginal observation after calving. In contrast, 30% of the French farmers applied such a post-partum examination. The examination for puerperal problems was mainly visually performed by the farmers themselves; they looked primarily for external visible signs like discharges or injuries. A more comprehensive examination of the reproductive tract only took place where suspicion existed. Moreover, a professional vaginal observation by a veterinarian was rarely performed. Only 5 out of 64 farmers stated that such a veterinary examination for all animals was carried out regularly. However, 21 Spanish farmers had selected animals professionally examined by a veterinarian on a routine basis.

Body temperature

An abnormal body temperature caused by various inflammatory reactions indicates the presence of an infectious disease. Thus it can be assumed that a continuous measurement of body temperature contributes to successful and early detection of a diseased animal. As already mentioned, early detection of diseased animals increases the chance for successful treatment. On this basis, farmers were asked to give cases (mastitis, metritis, metabolic disorders, after calving and lameness) where they measure the body temperature.

The results showed that 75% (France: 70%; Germany: 95%, Spain: 63%) of all farmers measured the body temperature of animals under suspicion; however, the frequency (i.e. whether temperature was measured or not) did not depend on the specific disease. The body temperature was measured with equal frequency for every case where disease was suspected. Other reasons given by farmers for monitoring body temperature were: abnormal feed intake, reduced milk yield, reduced rumination activity, decreased general (and body) condition etc.

Foremilk samples

Foremilk samples (first milk drawn from a cow's udder prior to milking) in daily milking routine are also essential for the detection of mastitis; since changes in the milk such as flocks, discoloration, or change of viscosity etc. can be perceived at an early stage of a disease. If necessary, the farmer can initiate appropriate treatment immediately. The respondents were asked whether and how often they take foremilk samples before milking. The majority of farmers (48 people) employed foremilk samples as an instrument/tool for early detection of mastitis. However, routine foremilk sampling did not take place on 16 out of the farms investigated, and 23 of the 48 farmers stated that only selected animals were subject to routine control of foremilk. Due to such inappropriate selection procedures, many diseased animals might not be recognised and an initial udder infection might develop into chronic mastitis. Regarding the procedure of taking foremilk samples, a significant difference between France, Germany and Spain could not be detected.

Udder palpation

The palpation of udders is also an important measure in daily milk routine which can aid for identification of localized indurations /nodules which are a sign of an udder disease. Early detection of an infected udder not only increases the success of treatment, but the prevention of transmission of pathogens to healthy animals too. Udder palpation as a method for an early detection of mastitis was widely used on all farms; 94% of all farmers palpated the udder regularly (see Figure 10). 52% of them even performed a regular udder palpation of every animal during every milking routine. The remaining 48% of farmers palpated the udder depending on clinical symptoms; meaning that only selected animals received an udder palpation.

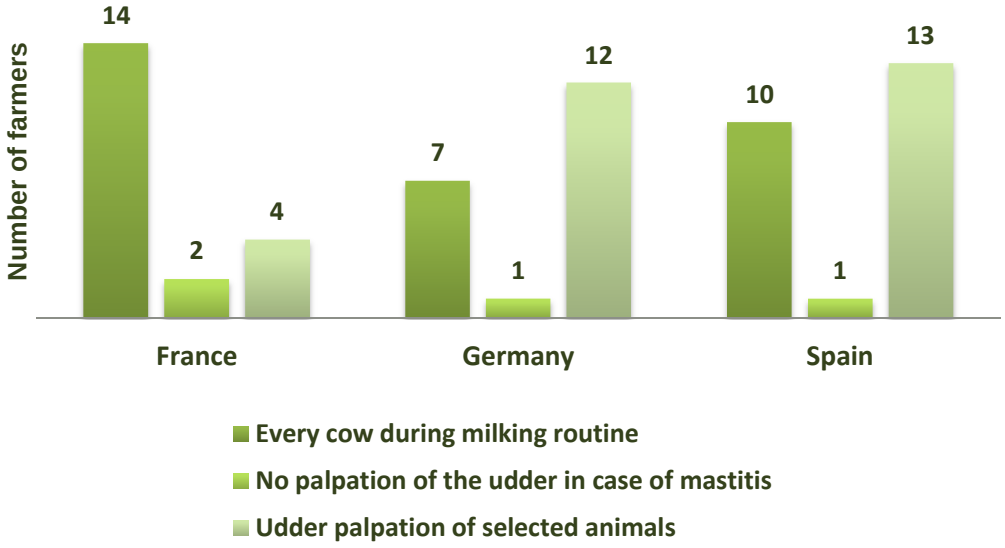

Figure 10: Palpation of udder

California mastitis test (CMT)

The California Mastitis Test is a rapid cow-side test to help estimate the somatic cell count of the milk. It is a simple but very useful technique of determining the presence of subclinical mastitis on-farm and provides an immediate result. A cow with subclinical mastitis does not have abnormal looking milk or any other clinical signs (e.g. swollen, painful udder or flocks etc.). The CMT reagent reacts with the white blood cells and the mixture thickens or gels in proportion to the amount of inflammation. This result is not a numerical result but an indication of whether the cell count is high or low; the CMT will only show changes in somatic cell counts above 300,000. The advantage of the CMT is that it provides a 'real-time' result; laboratory testing can take days for laboratory results to be returned. Therefore the CMT is a very useful method for the early detection of mastitis.

The results showed that CMT was not used on all farms; 20% of farmers never used it. However, the remaining 80% of farms used the CMT at irregular intervals where the use depended on the situation (see Figure 11): before drying off, after mastitis treatment or animals suspected of having mastitis. Only two Germans stated that all animals in all situations were tested using the CMT. In total, 14 farmers used the CMT in all situations, but in a more or less intensive way (only selected animals) and one farmer from Spain stated that the CMT was a fixed part of farm routine - all animals were tested by using the CMT every three months. Nevertheless, it is common practice that only selected animals are tested by means of CMT, this selective approach bears the risk of overlooking subclinical diseased animals resulting in delayed treatment. The following reasons for farmers' selection of animals were given, the ranking is based on the frequency of use of CMT:

1. Animals with suspected mastitis - no differences between the countries,
2. After a mastitis treatment (success control) - France: 13%; Germany: 38%; Spain 50% of farms.

Especially in Germany, the CMT was only rarely used before drying-off; French farmers never used it in this situation. Among "other" reasons, the following criteria for the use of CMT given by farmers were identified:

- Cows with high somatic cell count after milk control but without clinical mastitis in order to test which quarters is infected,
- After calving when being returned to milking,
- Change of conductivity of the milk (by alert of AMS) etc.

To sum up, there was no uniform use of the CMT. Instead, the criteria for animal selection and fields of application differed a lot between farmers and countries.

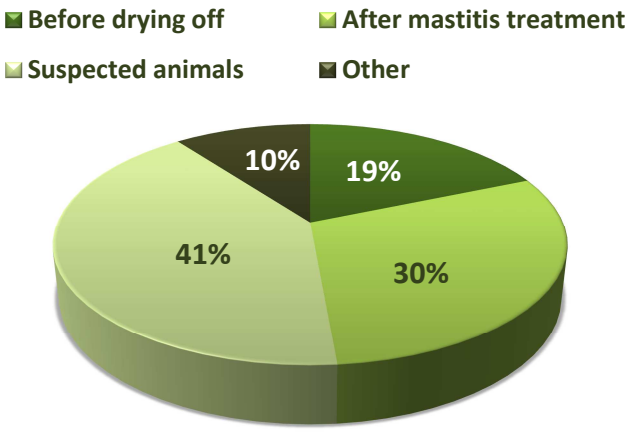

Figure 11: Use of CMT in different situations (multiple answers were permitted)

Animal observation

Animal observation is one of the most important ways to detect diseased animals as early as possible. An early treatment may offer the best prospect for the success of a treatment. Due to this, farmers were asked the way in which and how long they spent observing their animals each day for monitoring. Only seven of all farmers performed an animal observation while doing nothing else. The duration of observation differed a lot and ranged from 1 to more than 40 minutes per day (see Figure 12). All other farmers observed the cows in combination with other activities (e.g. milking routine, feeding, pasture etc.). It can thus be expected that farmers focussed more the above activities than on animal observation resulting, in the non-detection of diseased animals or important homeopathic symptoms. While French farmers observed animals for a period of 1 to 30 minutes, Spanish farmers took time for this task and often spent more than 40 minutes for this process.

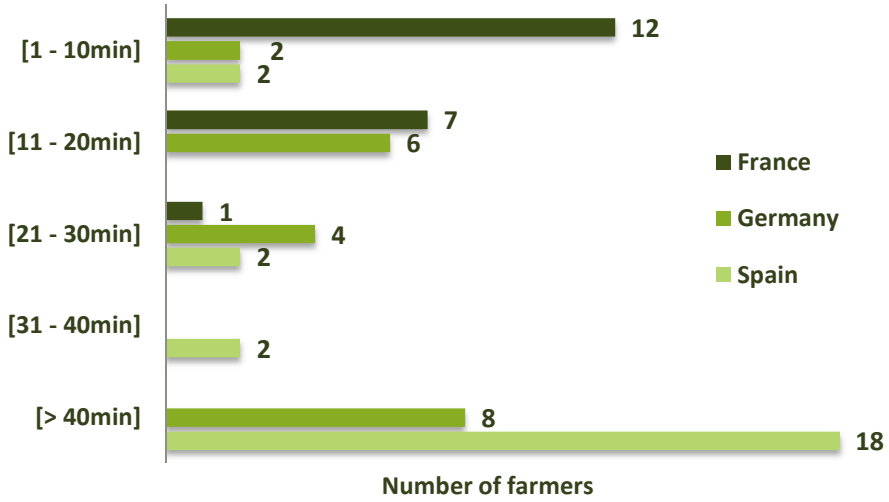

Figure 12: Animal observation

As positive aspect of the use of homeopathy is that most farmers (France and Germany: each 80%, Spain: 63%) stated that homeopathy changed their way of observation; the attention they give to diseased animals has increased.

5.3.3 Interim summary

The on-farm assessment of the conditions existing on many farms for homeopathic treatment often revealed poor hygiene and preventive management. Separate sick pens were rarely available. Most farmers used boxes for both diseased and calving animals without implementing some kind of disinfection measures. Moreover, specific recommended storage instructions for homeopathic remedies were not often fully followed by farmers. Almost all farmers saw the need to run a treatment when the SCC was above the value of 200,000 cells/ml; whereas a threshold of 100,000 cells per ml is recommended by the International Dairy Federation (IDF, 2013). Early detection measurements (e.g. body condition scoring, foremilk samples, udder palpation, the California mastitis test, measurement of body temperature etc.) were rarely performed and - if implemented - seldom documented. Thus, structural and non-structural preconditions on the test farms were often far from being appropriate to ensure the early detection of diseased animals and target-oriented treatment.

5.4 *Lege-artis* use of homeopathy

In the previous WP9 “Report on research projects in the field of homeopathy”, a homeopathic treatment according to the state-of-the-art (*lege-artis*) was developed, which consists of anamnesis, diagnostic, selection and use of homeopathic remedies, success control and documentation. The questions in the homeopathic questionnaire were categorised and assigned to one of these treatment steps. On the basis of this evaluation, an overview of the methods of homeopathic treatment on dairy farms in Germany, Spain and France can be gained.

5.4.1 Anamnesis

A profound anamnesis and diagnosis are essential for deciding whether a homeopathic treatment is appropriate and on the choice of the corresponding ‘remedy picture’. The process of anamnesis involves recalling the most relevant parts of the animal’s past history and is the most important factor in diagnosing and selecting the homeopathic remedy. The homeopathic diagnosis includes studying physical and mental symptoms and the animal’s constitution. The farmer undertakes a thorough observation of the animal, the unique signs and symptoms of the disease, notes the formation of the presumed causa and consults the disease history of family members need to be investigated. This process of finding out its peculiar characteristics helps to individualise a diseased animal. After considering all information received, a homeopathic remedy is chosen in order to start the self-healing process. Hahnemann stated that the more a drug is suited to the symptoms, the higher the chance of success.

Accordingly, questions concerning a homeopathic anamnesis were included in the questionnaire. First the respondents were asked where they obtain the historical health records of the diseased animals. Spain, Germany and France delivered a very heterogeneous result regarding where farmers sourced their information (see Table 7). 19 out of 24 Spanish farmers stated that they invariably have no historical information on the diseased animal or they try to reconstruct its medical history from their memory. A similar situation has been shown in Germany; farmers also generally obtained the medical history from memory. Only eight farmers used information from health ledger papers/cow files. In contrast to this, French farmers seemed to be better organised; 16 out of 20 farmers in France used paper files in order to put together a medical history. All in all, only 11 out of 64 farmers (17%) in all three countries made use of professional herd management software, e.g. Herde, Dairy Comp, Superkuh, Farmoffice etc.

Table 7: Source of historical medical information (multiple answers were permitted)

Source of historical information	Number of farmers in			
	Germany	France	Spain	
No information exists	**0**	**0**	**19**	
From memory	**6**	**14**	**19**	
From health ledger papers / cow files	**16**	**8**	**3**	
From herd management software	**5**	**5**	**1**	

Additionally, all farmers were asked to illustrate how they perform a comprehensive anamnesis for a diseased animal. The majority of respondents were quite united on the main point that a comprehensive homeopathic anamnesis not just includes local symptoms and general condition, but homeopathic symptoms (in the form of deviation from normal behaviour and character, modalities etc.) too. Due to time restrictions a lot of farmers could not perform a thorough homeopathic anamnesis. In order to provide an overview about the various anamnesis procedures, the answers were assigned into five different categories:

a) Approved Indications📖: the farmer looks for typical symptoms and chooses a tried and tested remedy for the symptom picture. Furthermore, the farmer often chooses the same remedy which has previously worked in similar cases.
b) Clinical anamnesis: the farmer only looks for local symptoms and general condition; usual in conventional practice.
c) Homeopathic anamnesis: the farmer does not just look at general condition and local symptoms, but also for homeopathic symptoms, e.g. causa, character, modalities, behaviour and constitution type, etc. This is usually extensive and very time consuming.
d) Assistance of a veterinarian: the farmer does not or only partially performs an anamnesis and consults a professional during the anamnesis or diagnosis process.
e) No anamnesis: the farmer does not perform an anamnesis due to different reasons, e.g. the farmer only uses complex remedies📖 or chooses the homeopathic remedy arbitrarily, etc.

This analysis revealed the following results (see Figure 13): French and German farmers had similar anamnesis procedures. Most farmers performed a more or less comprehensive homeopathic anamnesis or only used approved indications, which means using always the same remedies for the same disease. However according to the homeopathic concept; the remedy, dose and potency📖 is not likely to be the same for animals with the same disease. Each medicine has unique characteristics and covers unique symptoms. No two medicines are exactly the same. Interestingly, twice as many Spanish farmers than French and German ones performed a homeopathic anamnesis in order to find the best suitable remedy.

A pure clinical anamnesis (common in conventional medicine) is of little significance for the application of an appropriate homeopathic remedy, since only symptoms of the diagnosed disease will be taken into account. In order to choose the right remedy, individual symptoms must be considered. The more striking, singular, uncommon and peculiar (characteristic) the signs and symptoms found, the higher the chance to choose the most suitable remedy. General and indefinite symptoms, such as loss of appetite, debility and fever etc., demand little attention if they cannot be more accurately described. Symptoms of such a general nature are observed in almost every disease and prompt the use of almost every remedy (§ 153 Organon of medicine, 1842).

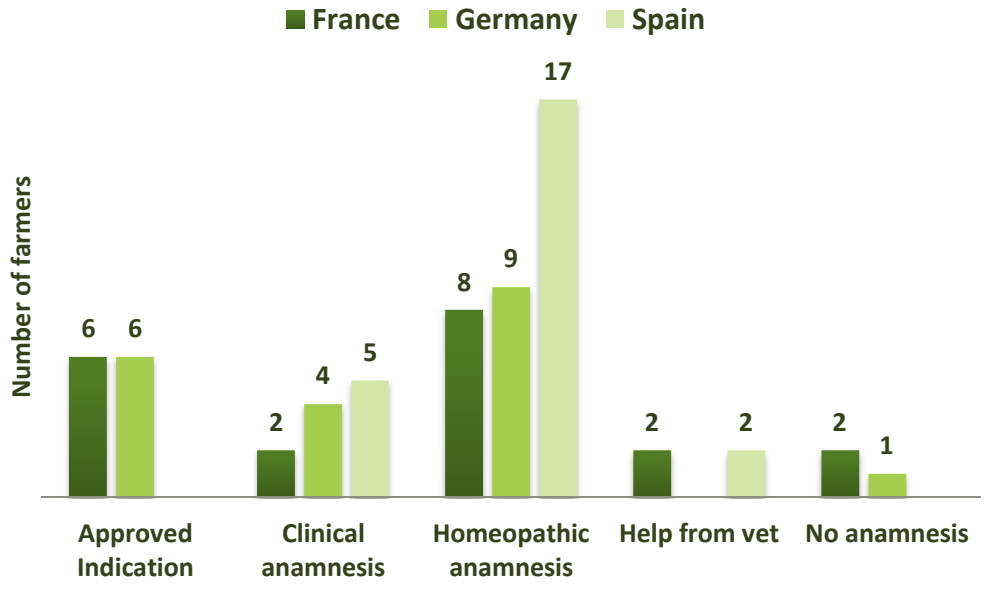

Figure 13: Type of different anamnesis procedures on farms

Furthermore, the experts evaluated the procedure of anamnesis on a 5 score scale from very good to very poor. Independent of the type of anamnesis method, 50% of farmers were rated with “moderate”; 19% with “good” and 27% with “poor”. The notes “very good” or “very poor” were awarded only once or twice. The results indicate that the type of anamnesis method had no influence on the quality of the anamnesis data collected.

5.4.2 Diagnosis

Homeopathic diagnosis is the process of identifying the nature of an illness and relies on thorough examination of the symptoms (anamnesis). Diagnosis is often challenging, because many signs and symptoms are nonspecific. The resulting diagnosis is only mildly dependent on the diagnostic label, e.g. mastitis, metritis or lameness etc., it is actually mainly based on many small details on the pathology and about the animal in general. So it may happen that two animals with the same disease or diagnostic label receive different homeopathic treatments.

Based on the fact that the process of diagnosis is often challenging for lay people, farmers were asked how often they seek the opinion of a professional homeopath in the diagnosis process. The result of evaluation illustrates a very widespread picture between countries. While French farmers generally never (80% of famers) / only for selected animals asked for the opinion of a professional, 75% of farmers in Spain consulted a professional in every case of illness. The other 25% of Spanish farmers looked for professional advice for specific diseases, such as lameness, strong mastitis, diarrhoea, oestrus induction etc. A relatively uniform distribution can be seen in Germany. This is mainly caused by the non-availability of professionals in the field of homeopathy. Most German farmers either never consulted a professional (35%), only where no recovery is foreseeable for the diseased animals (30%) or only in specific cases such as e.g. mastitis, retained placenta, downer cow, chronic diseases etc. A lot of farmers stated that they consulted a professional when the case was beyond their homeopathic skills, but those farmers had often already have treated their animals with homeopathy. The consequences of this arbitrary treatment could be that previous symptoms will be distorted, thus a professional if consulted might have problems in the resultant diagnosis process.

The evaluation of the poll also confirmed the assumption that farmers did not consult a veterinarian before they used homeopathic remedies on animals. Farmers were asked to indicate if they agreed or disagreed with the following statements (balanced answers were not considered). A similar picture could be found for the use of conventional medicine in France; more than half of the farmers stated that they did not contact veterinarians when employing conventional therapy. In contrast to that, nearly every farmer in Germany and Spain contacted the local veterinarian before using conventional medicines.

- “I always consult my vet before using homeopathic remedies to treat my animals”

	France	Germany	Spain
Agree	0	0	16
Disagree	20	19	8

- “I always consult my vet before using conventional remedies to treat my animals”

	France	Germany	Spain
Agree	8	15	18
Disagree	12	2	5

In total, 57 from 64 farmers were assessed within a consultation procedure on a 5-point-scale by IAVH-expert. This resulted in a negative trend: good (8 farmers), moderate (24 farmers), poor (10 farmers) and very poor (15 farmers). A point that was frequently criticized was that farmers call a professional homeopath too late. Furthermore, it seems reasonable to assume that consulting a professional regularly during the diagnosis process leads to an increased chance for the success of the treatment.

For the development of individual farm mastitis measures or mastitis treatment strategies, it is necessary to characterize the type of bacteria that are present in the udder by using laboratory milk analysis. In addition, the results of the milk analysis can be used to alter or optimise mastitis prophylaxis and treatment strategies. It is necessary to ensure that milk samples are taken before the animal receive antibiotics, otherwise the results of milk analysis are of no use, since the causative pathogens were destroyed by the antibiotics.

The farmers were asked for their diagnostic procedure before a mastitis treatment started (see Figure 14). More than half of all farmers (53%) stated that they never take quarter milk samples for laboratory cyto-bacteriological analysis before they treat mastitis. The remaining 47% only took quarter milk samples depending on the severity of the mastitis, effort and time for labour or course of treatment etc.: half of the named farmers only took milk samples in the case of clinical mastitis and 13% in the case of subclinical mastitis. However, in general a laboratory milk samples analysis was rarely considered; if at all. Only the milk of selected animals was examined. Just one farmer in Spain and one in Germany represented exceptions from the rule. They stated that they take milk samples from all animals in every case (subclinical and clinical mastitis) for laboratory microbiological analysis.

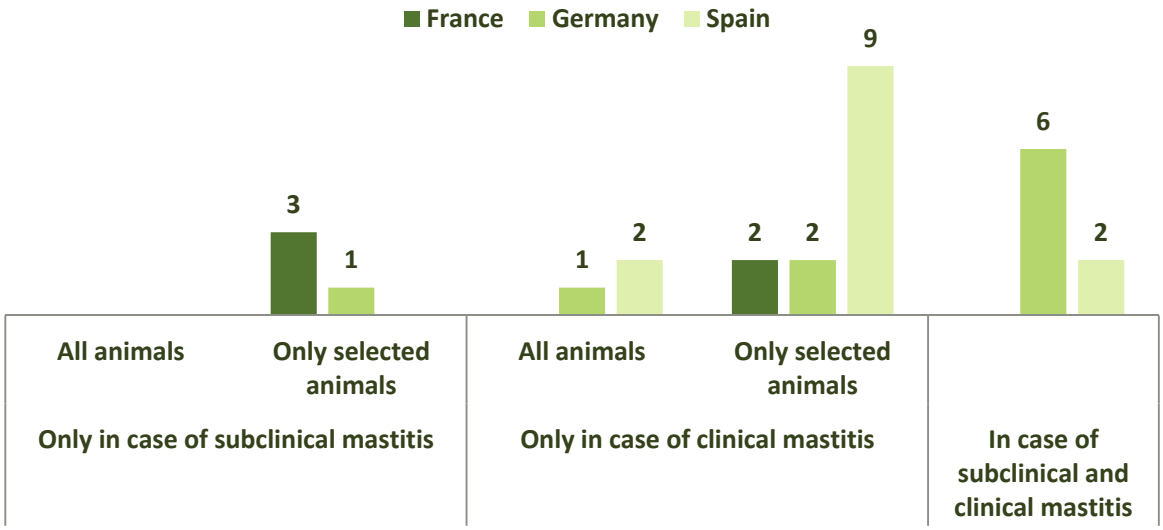

Figure 14: Taking milk samples for laboratory cyto-bacteriological analysis in case of subclinical and clinical mastitis

The result of the survey confirmed the assumption that milk samples for laboratory analysis before the beginning of the mastitis treatment were taken rarely in agricultural practice. A professional milk analysis often took place after an unsuccessful first treatment attempt.

5.4.3 Selection and application of a remedy

The basic principle of prescribing homeopathic remedies is to find the remedy that best matches all symptoms. There is a very large number of homeopathic remedies. However, only very few (mostly

complex remedies) are approved for food producing animals. Due to the fact that most of the homeopathic remedies approved for the use in humans can be rededicated by a veterinarian for the use in food producing animals, in principle many homeopathic remedies are available.

Each medicine has unique characteristics and symptoms that it covers. No two medicines are exactly the same. According to Hahnemanns' first rule "similia similibus curentur", the characteristics of the disease must be similar to the characteristics of the remedy (§ 153; Hahnemann & Haehl, 2004). In order to achieve the best selection, a repertorization is necessary, this means that the homeopathic drug picture and the clinical picture of the diseased animals must be compared with one another step-by-step. A similar disease (diagnosis) with different individual symptoms can often be cured by various remedies; conversely, one remedy can cure different diseases.

Once a remedy is selected, the appropriate choice of potency and the correct administration interval is important for the success of homeopathic treatment. The process of potentization is merely an accessory factor. "The Law of Similars" is the primary law of cure. If the correct remedy is selected, then it will act curatively in any potency (even though a correct potency will act more gently for the comfort of the patient); conversely, an incorrect remedy can be either inactive or disruptive to an illness, regardless of which potency is administered (Vithoulkas, 2002). There are no defined rules; however, in general it is recommended that if absolute certainty as to the suitability of the remedy selected exists and/or the illness is acute, a higher potency should be used. If there is less certainty as to the suitability of the selected remedy and the disease is chronic, lower potencies are recommended.

Due to the fact that there is a very high number of clinical or remedy pictures, farmers were asked which reference materials they used for choosing homeopathic remedies (see Figure 15). There was an almost homogenous distribution amongst the different types of references. French and German farmers were very similar respecting how they used reference materials. Both groups used mainly short manuals for homeopathy and sought by veterinarians for advice via telephone or e-mail. As far as the principles of homeopathy were concerned: 5 farmers from France and 4 farmers from Germany used a repertory in combination with a Materia medica. In contrast to the situation in France and Germany, all farmers in Spain counted on the advice of homeopathic veterinarians. Other reference materials, such as: internet, Material medica, repertory, short manual etc., were never or rarely used by Spanish farmers. In general, using software for repertorization of symptoms was not very popular amongst the farmers. The category "other" included consulting other farmer / other homeopaths / non-veterinary practitioner and notes from homeopathic courses.

A recently performed survey (Hornig, 2015) among veterinarians about the applicability of human homeopathic repertories in agricultural practice, illustrated the main problems / barriers in searching for animal symptoms. Most of veterinarians (72%) complained of difficulties in the translation of animal symptoms into human symptoms, 5% of the respondents mentioned the lack of proven veterinary rubrics/categories and 19% of them the lack of specific veterinary terminology. According to Hornig (2015), the greatest restriction in repertorization was the translation of human symptoms into animal symptoms; even advanced veterinarians in homeopathy have difficulties with this kind of translation.

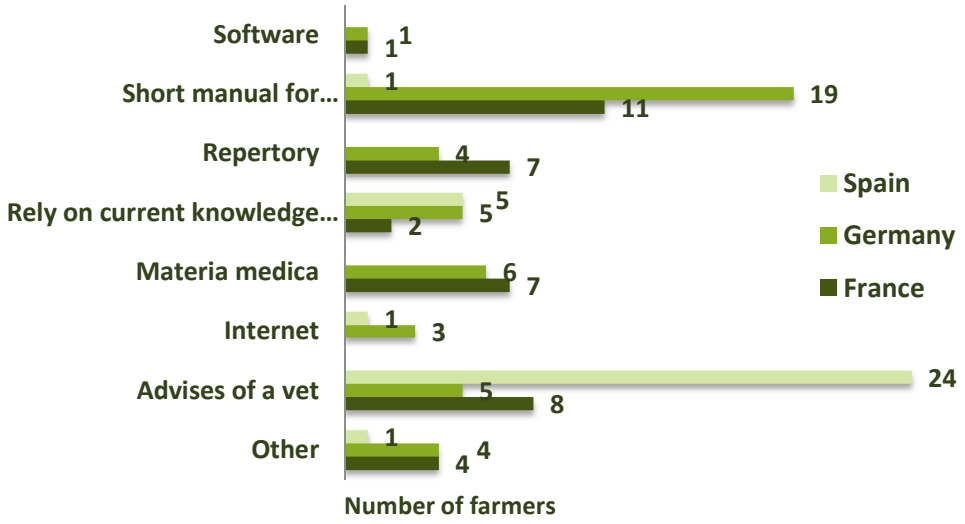

Figure 15: Farmer's reference materials (multiple answers were permitted)

In order to ascertain how a homeopathic remedy was selected, all interview partners were asked "How do you choose a remedy to treat a difficult or chronic case of disease?" A difficult or chronic case was used because those cases require all homeopathic skills, experience and expertise. The evaluation was based on five different categories:

a) Level 1 - No knowledge: use of complex remedies or "Schüssler Salze",
b) Level 2 - Basic knowledge: approved indications,
c) Level 3 - Advanced knowledge: anamnesis performed in addition; individual assessment of single animals with repertory, acknowledgement of remedies (Materia medica) and homeopathic remedy picture,
d) Level 4 - Expert: hierarchy of symptoms compiled in addition; symptoms according to §153 of Organon of medicine,
e) Level 5 - Top level: miasm or core of a remedy performed in addition.

The assessment produced a heterogeneous result (see Figure 16). The farmers only received level 1 to 3. Farmers were most frequently rated with Level 2, meaning that in cases of a difficult or chronic disease they often used approved indications. Only a minor percentage of the farmers (27%) were capable of performing a homeopathic and individual anamnesis or treatment of a case; they were assessed with Level 3. However, a few farmers (in total 14) only used complex remedies in difficult cases of disease; they were thus rated with Level 1. One Spanish farmer was not evaluated as the farmer never decided which homeopathic remedy to use and consulted the veterinarian in every case.

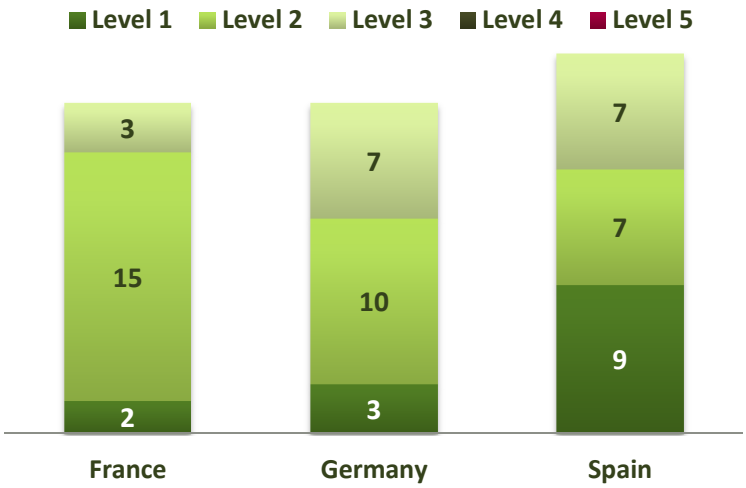

Figure 16: Assessment of users' level of awareness of the principles of homeopathy from level 1 (very poor) to level 5 (very good)

It is not only the choice of remedy that is important for alternative treatment, but the availability of homeopathic remedies as well. There are different means of obtaining drugs, e.g. the internet, pharmacies and veterinarians. Therefore the farmers were asked where and what percentage of homeopathic remedies they get from each source.

The results showed that most homeopathic remedies were ordered and bought in pharmacies (see Table 8). The main problem here is that the majority of these remedies are designed for human use and are not prescribed by veterinarians. In this case, farmers rededicated human homeopathic drugs by themselves. However, this rededication is only allowed to veterinarians.

Table 8: Availability of homeopathic products (Number of farmers)

Source	Country	Extent of purchase 0-25%	26-50%	51-75%	76-100%
From veterinarians	France	5	-	-	2
	Germany	2	2	-	2
	Spain	1	2	-	12
From pharmacy	France	1	1	-	17
	Germany	3	4	-	11
	Spain	1	2	1	9
From Internet & Other	France	-	-	1	-
	Germany	-	1	1	3
	Spain	-	-	-	-

Thus, many farmers violated European and national legal regulations. Only 28 out of 64 farmers stated that they received homeopathic remedies via their local veterinarian. Online purchase of homeopathic products and other sources like foreign companies or products produced by non-veterinary practitioners only played a minor role. 18 of 64 farmers stated that they purchase homeopathic drugs from more than one source. The following table shows the current availability of homeopathic remedies according to the percentage of homeopathic remedies purchased (multiple answers were permitted).

It is not only the easy access to homeopathic remedies that is essential to the decision to use homeopathy, but also the time period until the ordered remedy is available. In order to find out whether the length of waiting time for the appropriate remedy has an influence on the decision over which treatment method (homeopathy or conventional treatment) farmers use first, farmers were asked for the average duration until the appropriate homeopathic / conventional remedy from veterinarian or pharmacy is available.

In general, conventional products were available more quickly than homeopathic remedies (see Figure 17). Most conventional products were available straight away and farmers had to wait longer than one day in few cases. In contrast, 21 farmers needed to wait at least a day for homeopathic remedies. However, one Spanish farmer stated that he has never used conventional medicine. The results indicate that the length of the waiting time seems to have no influence on the decision to use homeopathy.

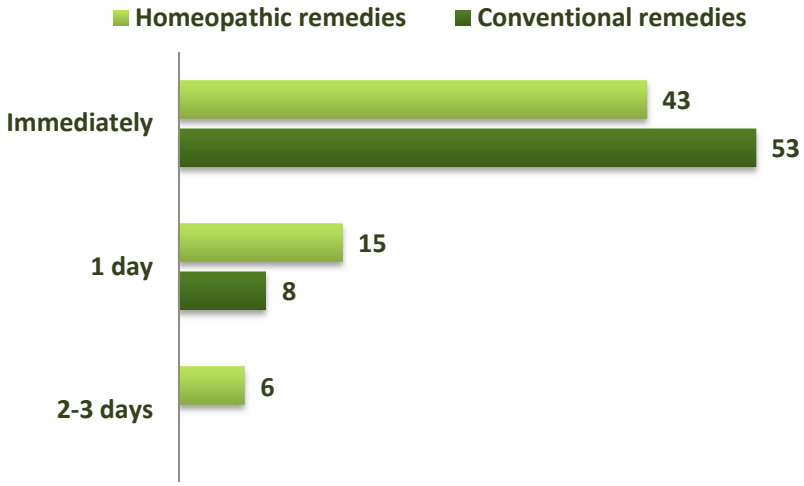

Figure 17: Duration until the appropriate remedy is available

To avoid a delay in treatment with homeopathic products, the most frequently used homeopathic remedies should be available on the farm. Due to the high number of homeopathic remedies there are different recommendations on which remedies should be kept in stock. During the farm visits, the scientists made a short inspection of the 'stable pharmacy' in order to find out how many and what kind of homeopathic remedies were available on the farms. In total, 324 different homeopathic remedies were found on all farms, among them 240 pure/single remedies, 36 complex remedies and 48 nosodes. The amount of homeopathic remedies available on farms varied considerably (see Table 9). The following Tables 9 and 10 provide an overview of the homeopathic supplies in 'stable pharmacies' on farms in Germany, France and Spain.

Table 9: Availability of homeopathic remedies on farms

	Germany		France		Spain	
Total Number of different remedies	**324**		**40**		**47**	
Number of available remedies	Minimum	11	Minimum	3	Minimum	0
	Mean	65	Mean	13	Mean	7
	Maximum	218	Maximum	20	Maximum	24

In addition a ranking from 1 to 10 of the most frequently used homeopathic remedies on all farms was conducted.

An important observation was that some farmers might violate the law because some homeopathic substances as *Colchicine* and *Aristolochia* (forbidden for food-producing animals) were also found in stable pharmacies. Both of the above-mentioned substances were identified on 11 farms, and there is reason to believe that these remedies were used to treat food-producing animals.

Table 10: Ranking of most commonly used homeopathic remedies on farms

Rank	Homeopathic remedy	No. of farms
1	ARNICA	43
	PHOSPHORUS	43
	PHYTOLACCA	43
2	SILICEA	42
3	APIS MELLIFICA	39
	BELLADONNA	39
4	HEPAR SULPHURIS	38
5	BRYONIA	36
	CALCIUM CARBONICUM	36
6	ACONITUM	34
7	CALCIUM PHOSPHORICUM	32
8	NUX VOMICA	31
9	RHUS TOXICODENDRON	30
	SEPIA	30
10	CARBO VEGETABILIS	26
	CHINA	26

At the same time, an inquiry into conventional medicines stored on the farms was performed as well (as part of the pharmacy inspection). However, it has to be taken into account that this overview only serves as orientation, since some farmers did not grant full access to their 'stable pharmacy'. The following list provides an overview of conventional drugs available on the farms with the most frequent first:

- Antibiotics;
- Other: vitamins/minerals, antiseptic-protective wound sprays, insecticide, oral rehydration solution, respiratory stimulation drugs, non-antibiotic intramammary seal udder injectors etc.;
- Infusions (Glucose, Calcium etc.);
- Mastitis injectors for drying off;
- Hormones (oxytocin, gestagene etc.);
- Antiparasitic agents;
- Mastitis injectors for lactation;
- Ointments (udder, limb etc.);
- Anti-inflammatory drugs;
- Analgesics;
- Sedatives/Hypnotics (Xylazin, Ketamin etc.);
- Vaccines.

One of the most fundamental principles of classic homeopathy is the prescription of only one remedy at a time. If more than one remedy is prescribed, any positive or negative effects might not be assessed accurately as the prescriber cannot distinguish which components of a combination or of complex remedies was effective. In addition, it is not possible to predict the interactions which might occur between given remedies.

In this study, farmers were asked what percentage of homeopathic complex remedies and single remedies they use in the case of mastitis, metritis, metabolic disorders, and lameness. The respondents had to indicate which diseases they treated with what kind of homeopathic products (complex and/or pure remedies.) Figure 18 shows the ratio of homeopathic pure remedies to complex remedies used to treat the above mentioned diseases. In general, the farmers used homeopathic pure remedies nearly twice as much as complex remedies. The farmers in Spain, France and Germany displayed no significant difference in their use of homeopathic products, except for metabolic disorders. German farmers were the main group treating metabolic disorders; all of them stated that they treat metabolic disorders with pure and/or complex remedies. The treatment of metabolic disorders and disturbed general condition with homeopathy only played a minor role in France and Spain. Whereas farmers in France and Germany focussed on treating the most frequent production diseases, the treatment of “other” diseases, e.g. warts / skin problems, diarrhoeas, parasite infections, respiratory diseases, injuries/traumata, intoxications, indigestion etc. seemed more popular amongst Spanish farmers.

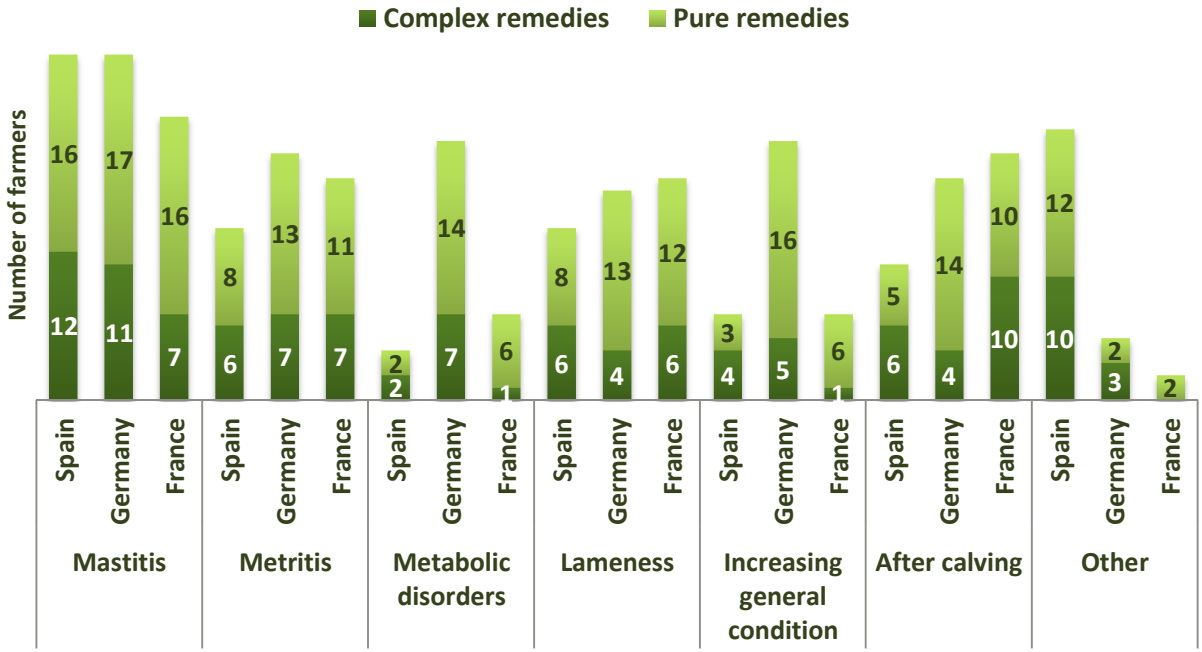

Figure 18: Use of homeopathic complex and pure remedies for different diseases (multiple answers were permitted)

It is not just the combination of different homeopathic substances, which need to be considered within the treatment procedure, but also combinations with other methods of treatment, e.g. antibiotics, acupuncture, udder ointments, phytotherapy etc. About 50% of farmers (13 in Spain, 6 in France and 15 in Germany) combined homeopathic treatments with other treatment methods. Combinations of different therapies were especially widespread in Germany. These farmers combined different treatments six times more frequently than French farmers and more than twice as much as Spanish farmers. Figure 19 illustrates how often farmers in Spain, Germany and France made use of combinations of homeopathy and conventional medicine and/or other alternative

methods. Altogether, the treatment of mastitis with both homeopathic and other methods was the most popular combination among farmers; in 19 of 23 cases homeopathic remedies were combined with conventional treatments (antibiotics, anti-inflammatories and udder ointments) and occasionally with “others” (phytotherapy, healing earth, curd and acupuncture). The main problem in the use of udder ointments was that these products mostly contained strong odours, like camphor or peppermint, which might have had a negative influence on the efficacy of homeopathic substances. The treatment of metritis, metabolic disorders and lameness with homeopathy were also often (75-100%) combined with conventional medicine (antibiotics, lavages, infusions, footbath etc.). Combinations with other alternative methods (phytotherapy, acupuncture, rock oil, leeches etc.) only played a very minor role.

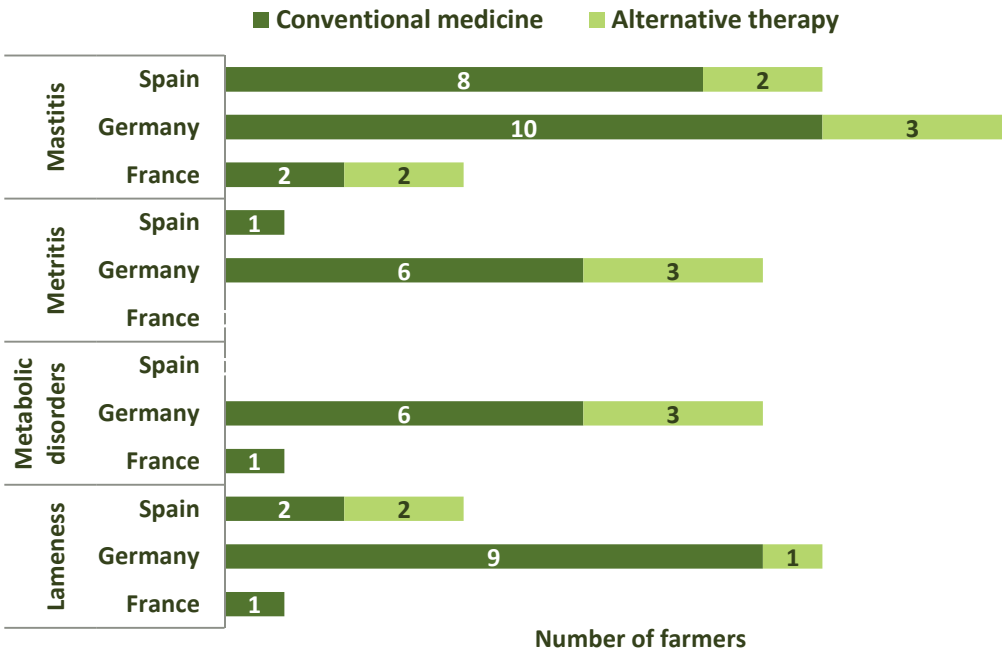

Figure 19: Use of homeopathic complex and pure remedies for different cases of diseases (multiple answers were permitted)

5.4.4 Control of success

One of the most difficult decisions to make in the course of treatment is whether or not to change the remedy because the selected remedy has only had an ambiguous effect. The basic rules of homeopathy state that the more vigorously the body is producing symptoms prior the administration of the remedy, the more quickly the body should react to the appropriate remedy. For example, in an acute case of disease it can be expected that the remedy will act very quickly (e.g. in 10 - 15 min.) and in a case without vigorous symptoms, the homeopathic prescriber can expect success between 48 and 72 hours. In a chronic case, when symptoms have been present for many months or years, the remedy can take a long time to be successful. If after waiting an appropriate period of time no changes have occurred, it must be concluded that the wrong remedy has been selected. In this case, the symptoms should be revaluated and another remedy should be chosen. Where only the symptoms change and no complete recovery occurs, the body of the animal is still attempting to heal itself. A new remedy should be selected which is related to the new symptoms. A potential risk of homeopathy occurs when the user treats the animals continuously even when a treatment is no longer indicated. It is recommended not to make use of a medicine longer than one week unless under professional homeopathic care. A further, very significant, risk in homeopathy is delayed use

of other effective medical treatments. Delayed treatments often have lesser prospect of success, since valuable time has elapsed and a chronic disease might already have developed. Unnecessary suffering of farm animals may result from the delusion that homeopathy is effective for any kind of disease. Professional homeopaths should know when conventional treatment is required.

The results of the survey (see Figure 20) showed that the majority of farmers (83%) check the success of treatment when it has finished. While in Germany and France all farmer check the success of treatment, nearly half of Spanish farmers do not pay attention to this part of a *lege-artis* treatment and do not check how successful the measure has been.

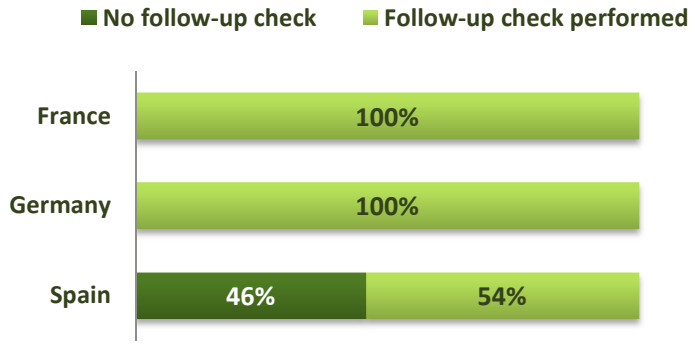

Figure 20: Success control by farmers

Moreover, farmers were asked if veterinarians regularly checked how successful their treatment had been. In France and Germany, the success of treatment was not (or only in very few cases) checked by local veterinarians (see Figure 21). In Spain, a follow-up check by veterinarians was more common, 63% of farms used this veterinary service. A veterinary assessment of the treatment success mainly took place for metritis and metabolic disorders. However, the number of animals (all or selected animals) which were examined by a veterinarian, depended on each farmers' criteria and differed a lot between the countries. Two of the Spanish farmers stated that all animals treated were re-checked by a veterinarian. To sum up, the assessments of treatment success after treatment were mainly performed by farmers.

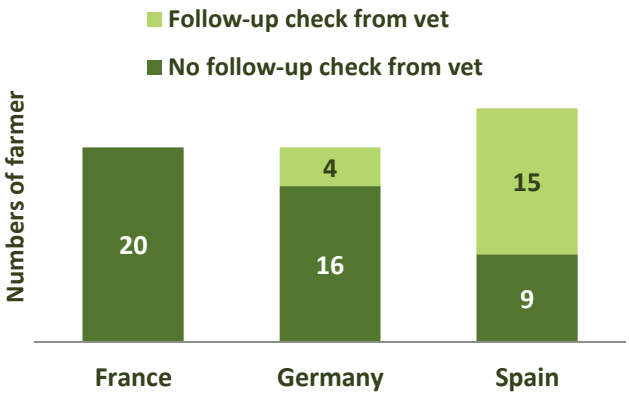

Figure 21: Follow-up checks from veterinarians

In most cases, the follow-up checks for the most common production diseases in dairy production (mastitis, metritis, metabolic disorders and lameness) were performed visually (see Figure 22). In addition to the visual checks for mastitis, success of treatment was also ascertained using clinical investigations (e.g. CMT, udder palpation etc.). The main problem with a purely visual follow-up

check is that subclinical diseases or animals that have only partially recovered can be overlooked resulting in relapse or chronic disease.

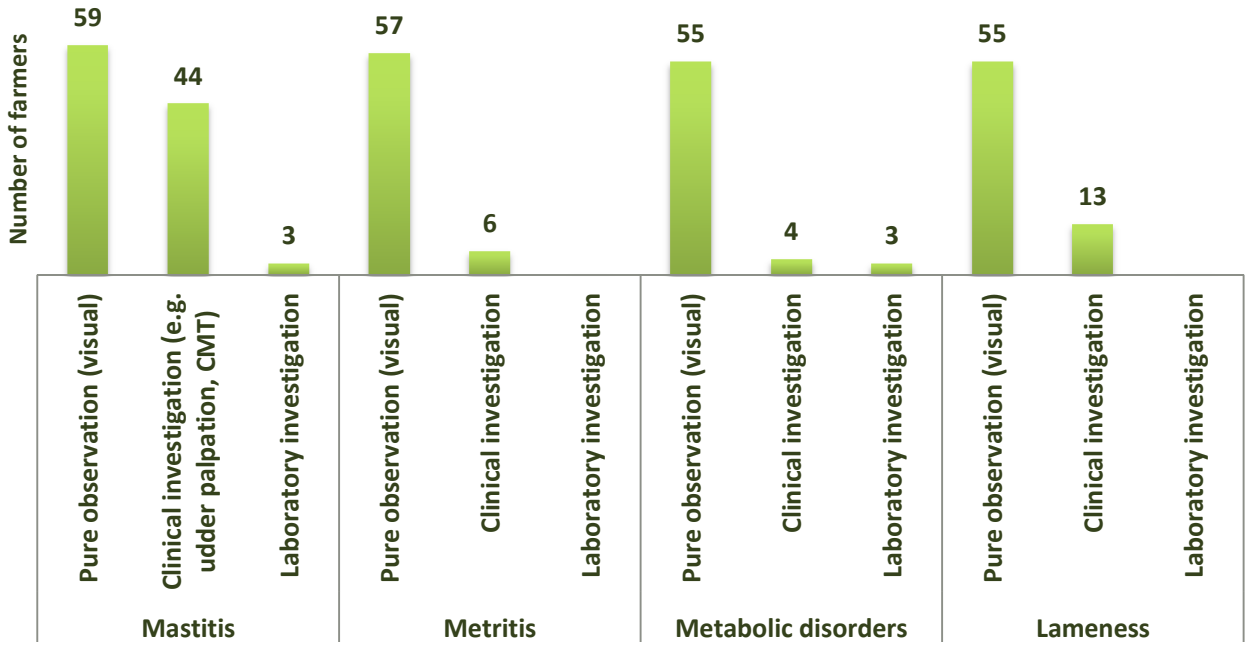

Figure 22: Methods for follow-up checks (multiple answers were permitted)

Even though a *lege-artis* treatment has been carried out, it may be that an animal will not recover. Therefore, farmers were asked about steps they would take if the homeopathic treatment was not successful. Due to the extremely heterogeneous answers, evaluating using categories was not possible. The most frequently given answers were:

- Make an immediate switch to conventional treatment (most given answer);
- the farmer calls the vet/homeopath in order to adapt the homeopathic treatment;
- the farmer waits a particular length of time (1h, 24h or 48h) and then changes the homeopathic remedy;
- if animal health does not decrease dramatically, farmer changes homeopathic remedy several times (from one remedy to as many as needed);
- if animal's life is in danger, the farmer calls the vet and changes to a conventional treatment,
- if no recovery in a case of mastitis occurs, the udder is dried off;
- in no recovery is foreseen; animals are culled;
- further treatment depends on the state of lactation: with mastitis at the drying off period, the animal will be dried off; where mastitis occurs at the beginning of lactation, the farmer does nothing or changes to conventional treatment;
- withdrawing milk from infected udder and waiting for recovery;
- each animal receives 1 or 2 homeopathic "trials", then are switched to conventional treatment if no recovery is observed;
- after 2 homeopathic "trials", the farmer calls the homeopathic veterinarian;
- the farmer waits and keeps searching for another homeopathic remedy until the very end.

However, for various reasons (e.g. poor general condition of animals, poor hygiene management, delayed treatment, antibiotic resistance, etc.) it is reasonable to assume that conventional treatment

will not be successful either. Therefore, farmers were asked about the actions they would take in this scenario. The responses were also very heterogeneous and could not be categorized.

Farmers' most common answers were:

- culling the animal if no recovery can be foreseen;
- switch the type of conventional medicine;
- return to homeopathy;
- in a case of mastitis - dry off the infected udder;
- calling the veterinarian, who decides the next steps;
- support conventional treatment with homeopathy;
- change to another alternative treatments (acupuncture, phytotherapy).

In summary, farmers dealt with the issue of follow-up checks quite differently; no uniform procedure was detectable. The number of animals to be examined and the way of performance of the success control depended on the farmers' own criteria. Due to the non-standardised procedure of the assessment of treatment success, farm animals may be suffering unnecessarily.

5.4.5 Documentation

Documenting treatment is important for two reasons: Firstly, people who treat food-producing animals are instructed by law (European and national legislation) to document every treatment they have given to diseased animals. The obligation to document serves to ensure the protection of public health. Secondly, documenting will help the prescriber to ascertain whether the given treatment was successful or not. Based on the documentation, the prescriber is able to review the previous treatment process and to change or optimize the treatment strategy. Only by continuous monitoring of the animals treated can an increase in healing rates and an improvement in the general animal health and welfare issue be achieved.

For both reasons, two questions in the questionnaires deal with farmers' documentation procedure. First of all, farmers were asked whether they use any documentation and if so how extensively they record details. In order to evaluate how comprehensive their documenting was, farmers were asked to choose from one of three possible options for each documentation step (diagnosis, treatment, change of remedy and follow-up check): never (0%), partially (1-99%) or every time (100%).

In total 11 out of 64 farmers (9 from France and 2 from Spain) stated that the documentation was always carried out for 100 percent of homeopathic treatment. In Germany, no farmer claimed to document every step every time. Four French, 12 German and 17 Spanish farmers (in total 52% of all participants) did not document a single step in cases of disease. All other remaining homeopathic prescribers documented partially: depending on the severity or type of disease, on the availability of farmers' time and on the type of treatment. Generally, where homeopathic treatment was concerned French farmers documented more thoroughly than farmers in Germany and Spain.

There is always the risk that treatment is not successful and that the therapy or remedy has to be modified. The initial symptoms might have changed, due to the previous homeopathic treatment. Without documenting initial symptoms, it is difficult - if not impossible - to find the appropriate remedy. 42% of Spanish, 50% of French and 70% of German farmers did not document homeopathic symptoms. Documenting symptoms during conventional treatment was almost non-existent. On 71% of Spanish, 90% of German and 95% of French farms documentation did not take

place. The few remaining farmers took anamnestic records in varying degrees of quality and quantity.

When reflecting on the issue of documentation, it has to be taken into account that no legal regulations exist that demand health recordings from the farmer. On the other hand, neglecting any documentation in relation to the health issue reduces the potentials to succeed in performing diagnosis and treatments. It can be assumed that many farmers were not prepared to document the use of homeopathy due to the fact that they might be liable to prosecution if they use human homeopathic remedies without rededication by a veterinarian. Taking the trouble to rededicate a remedy may cause further efforts and costs.

5.4.6 Interim summary

The questionnaires to the farms revealed that there were no uniform treatment procedures in the use of homeopathy, neither for anamnesis, diagnosis nor for selection and application of the homeopathic remedy. It seems that each farmer had developed his/her own homeopathic treatment strategy; regardless of the principles of homeopathy. Moreover, most farmers only had a poor level of awareness of the principles of homeopathy; as evaluated by the homeopathic experts. Furthermore, the results show that many homeopathic prescribers treated animals by making use of approved indications or complex remedies and only a small group of homeopathic "experts" repertorized clinical symptoms after the classic sense of homeopathy. In many cases, farmers' behaviour was illegal by making use of homeopathic products not approved for food-producing animals or which are dedicated for human use and as such are only permitted to be used on farm animals by veterinarians who have to rededicate these human products following both European regulations and the cascade principle. A follow-up check was often only performed visually by the farmers themselves. Only where no recovery was foreseeable did farmers consult a veterinarian for further treatment help. This study found that these "solo" efforts by farmers might be caused by the poor level of assistance from veterinarians. Finally, it was revealed that homeopathic treatment and the outcomes were rarely if never documented. Therefore, only very little information about the homeopathic substances applied and the healing rates for food-producing animals under homeopathic treatments were available. The results indicate that a homeopathic *lege-artis* treatment of diseased food-producing animals is missing. The self-referential independent, un-aided use of homeopathy by farmers could create unnecessary suffering for diseased animals.

6 Attitudes toward homeopathic and attitudes toward conventional treatments

The intention in conducting an additional questionnaire was to obtain additional information about motivations which lay behind treating food-producing animals with homeopathic remedies. In face of the current discussion about antibiotic resistance to pathogens, respondents were also asked about possible reasons for the development of resistance. Farmers needed to indicate how strongly they agreed or disagreed with each statement on a 5-point-scale. In order to ascertain the trend for or against a statement, the categories "agree strongly" and "agree" were summarised into "consent" and "disagree" and "disagree strongly" were summarised into "reject".

In general, the farmers' answers from all three countries did not differ much from one another (see Figure 23). Only marginal differences were found for statements concerning the cause of antibiotic resistance in human population and the issue of conventional treatment of mastitis and the associated withdrawal period. In contrast to France and Spain, the majority of German farmers

(55%) rejected the statement that the employment of conventional remedies for dairy herds is a major cause of antibiotic resistance in the human population. Some farmers stated that this situation was mainly caused by the use of antibiotics for pigs, poultry and in human medicine. Almost all farmers (48 people) saw the general necessity to decrease antibiotic resistance. 12 farmers took a neutral position, since they already made minimal use of antibiotics and they saw no further way of reducing this. A second significant difference was found in the statements about homeopathic treatment being more effective for mastitis treatment than the use of antibiotics. French farmers in particular, consented to this statement. A total of 36 farmers neither agreed nor disagreed, arguing that the effectiveness of homeopathic treatment depends on each individual case (severity of illness) and each animal: “Homeopathy can be effective where you find the right remedy”. Proponents stated that if the homeopathic treatment is successful, the udder will completely recover and in conventional treatment relapses often occur. An important reason for farmers to use homeopathy was the withdrawal of milk from human consumption due to the use of antibiotics. Another reason was to satisfy costumers’ needs: organic food without antibiotic residues. However, a lot of farmers mentioned that their efforts were not adequately remunerated; consumers should reward good food quality better.

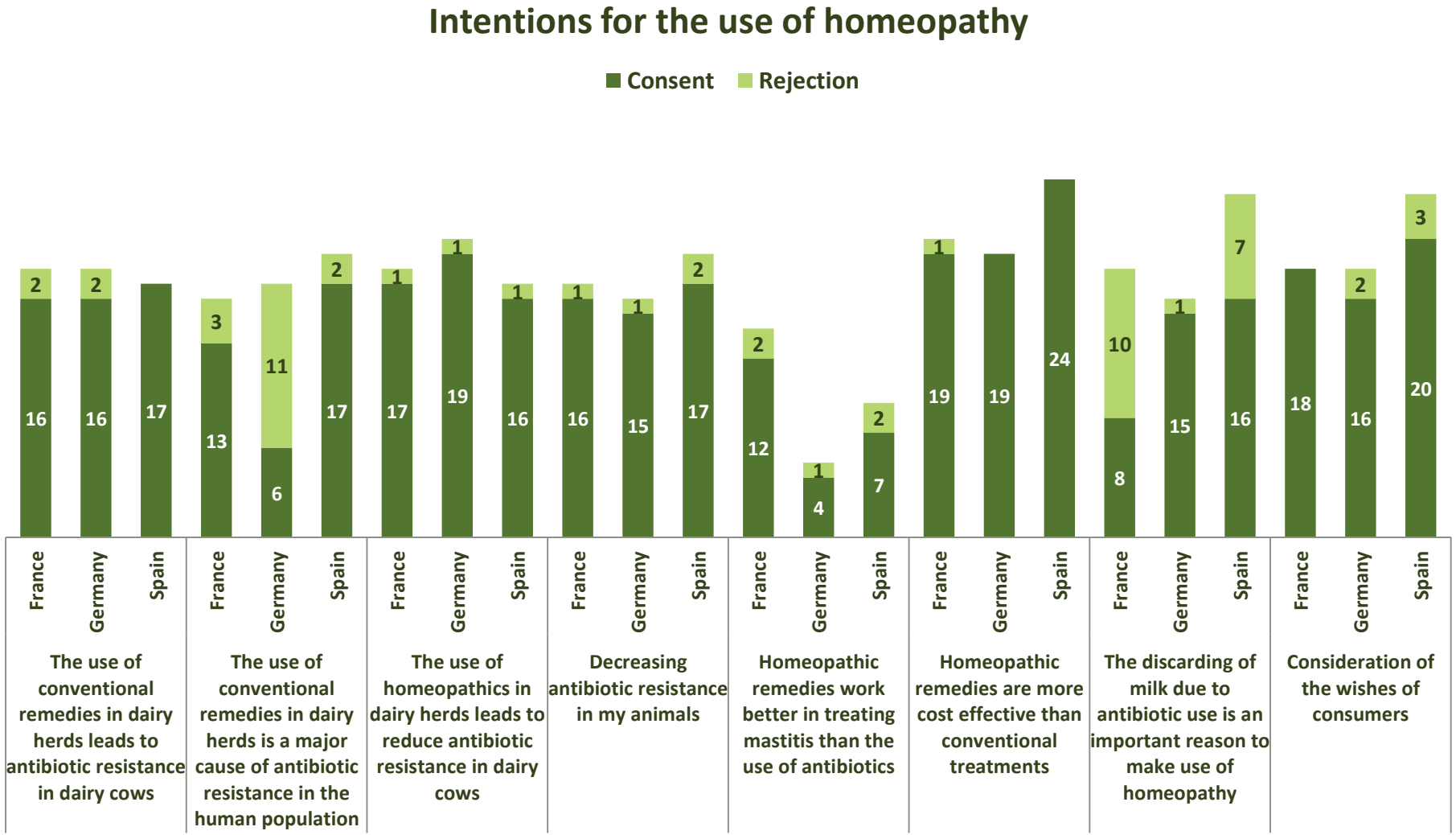

Figure 23: Farmers' intentions for using homeopathy

7 Drivers and barriers for the use of homeopathy

7.1 Definition of intention

Intention was measured by a single question in the survey dataset which asked veterinarians to estimate the likelihood that they would prescribe a homeopathic treatments for any of their clients in the next 12 months. The strength of their likelihood estimate was measured using a 5-point Likert scale where 5 = 'Definitely' and 1 = 'Definitely not'.

Figure 24 shows the distribution of intention to use homeopathic remedies amongst the sample of veterinarians (number of respondents = 41).

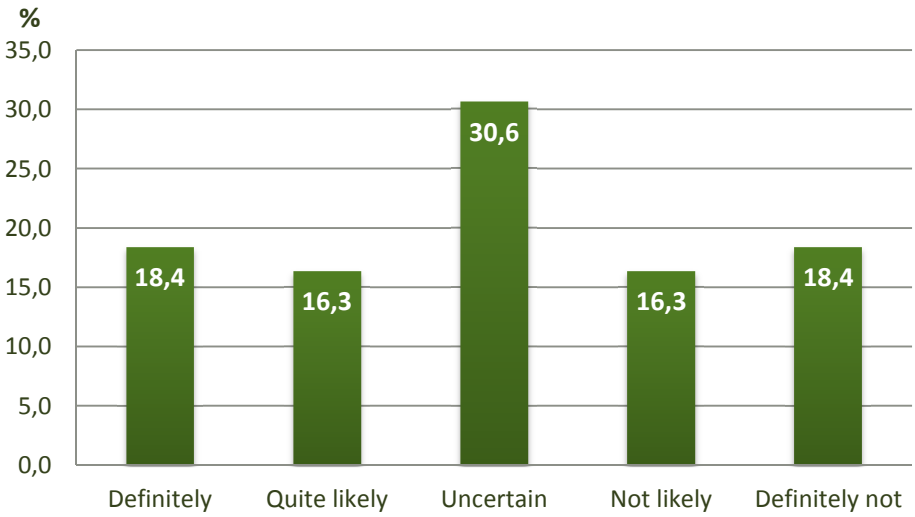

Figure 24: Distribution of intention of vets to use homeopathy in the next year

Several survey questions captured information on the current use of homeopathic remedies by the respondents themselves, but also other veterinarians within their practice, as well as their clients (farmers). Future intention was found to be unrelated to the current level of use of homeopathic remedies (χ_2 = 3.27, p=0.1948). Intention was also unrelated to the level of use of homeopathy among respondent's colleagues within veterinary practices (excluding sole traders) (χ_2 = 4.12, p=0.1276). However, a stronger association (although of borderline statistical significance) was observed between intention and the level of use of homeopathy by clients (χ_2 = 5.39, p=0.0675). On the basis of these results, this last of the three potential drivers of intention was carried forwards for further analysis in the regression modelling reported below, while the first two were dropped.

7.2 Calculated attitude, normative and perceived behavioural control variables

For each of the behavioural components of the TPB analysis i.e. outcome attitudes (OA), perceived behavioural control (PBC) and subjective norms (SN) a carefully crafted suite of questions (for a list of these questions see Annex V) were used to create composite, indirect measures. In the case of subjective norms, because this study examined the intentions of farm advisers (largely vets) rather than farmers themselves, an additional special class peers was added, representing the advisors own clients (farmers).

The composite variables were calculated for each of the three TPB components (OA, SN and PBC) by summing over a number (*i*) of relevant questions/variables. The PBC and SN rank scores, (both 7-point rank scores) (*b*), were weighted by a 7-point importance score (*e*) before aggregation, while

the OA questions were un-weighted. All of the OA variables were re-based to a 5-point ranking scale, for the purposes of aggregation.

Cronbach's Alpha was calculated to test the coherence of each of the three composite components (or measures), as shown in Table 11. A high Cronbach's Alpha (assumed to be >0.6) indicates that the different items contributing to a measure, when summed, produced a coherent composite measure. Items that significantly reduced the Cronbach's Alpha score were removed from composite measures and could only be used individually as correlates with intent. Because of the extent of variation in the ranges of the three TPB scales, the standardised Cronbach's Alpha Coefficient was used. In the case of each of the three composite TPB measures, while coherence based on all available items exceeded 0.6, one or more of the contributing questions was deleted in order to maximise coherence (these deleted questions are included individually in the correlation analyses reported below and are presented in italicised text in Table 13). It should perhaps also be pointed out that while a high level of coherence was obtained for the composite SN variable, there is no a priori reason why coherence is necessary for this particular composite variable, as it is legitimate for peers to have significant variation in their level of approval of the intended action.

Table 11: Mean, median and maximum permissible range values for TPB measures, plus Cronbach's Alpha Coefficient, for the whole sample.

Measure	Number of questions (*i*) included in the composite measure	Sample mean	Sample median	Maximum permissible range	Chronbach's Alpha (Standardised)
Outcome Attitude (OA)	5	13.80	13.0	5 - 25	0.620
Subjective Norms (SN)	11	173.05	163.0	11 - 493	0.892
Perceived Behavioural Control (PC)	5	87.74	64	5 - 245	0.894

7.3 Determinants of intention to use homeopathic remedies

Figure 25 shows the correlations between the attitude, subjective norms and perceived behavioural control measures with intention to use homeopathic remedies in the next 12 months. Because intention and the other variables are based on ordinal scales, Spearman's Rho correlation coefficients (r_s) were generated. As Figure 25 shows, outcome attitude (OA) has the strongest correlation with intent and this correlation is statistically significant at <1%. Subjective norms (SN) showed a negative correlation with intent, but this is due to the fact that SN and intent have inverse scales (i.e. for SN 1='Greatly approve', while for Intent 5='Definitely'). To correct for this the sign of the correlation coefficient (and the Rho correlation coefficient also) must be reversed, i.e. both SN and PBC are in fact positively correlated with intent. The SN correlation with intent is on the low side and is only borderline statistically significant. PBC has a very low correlation coefficient and is highly non-significant, suggesting that the attitudes (towards homeopathy) of peers do not influence intent – this suggestion will be confirmed, or refuted, in the regression modelling reported below. Embedded within the PBC composite variable are the attitudes of clients and, as the effect of this source of influence may therefore be masked, this variable will be extracted from the composite variable and separately assessed, as a potential driver of intent, in the regression modelling reported below.

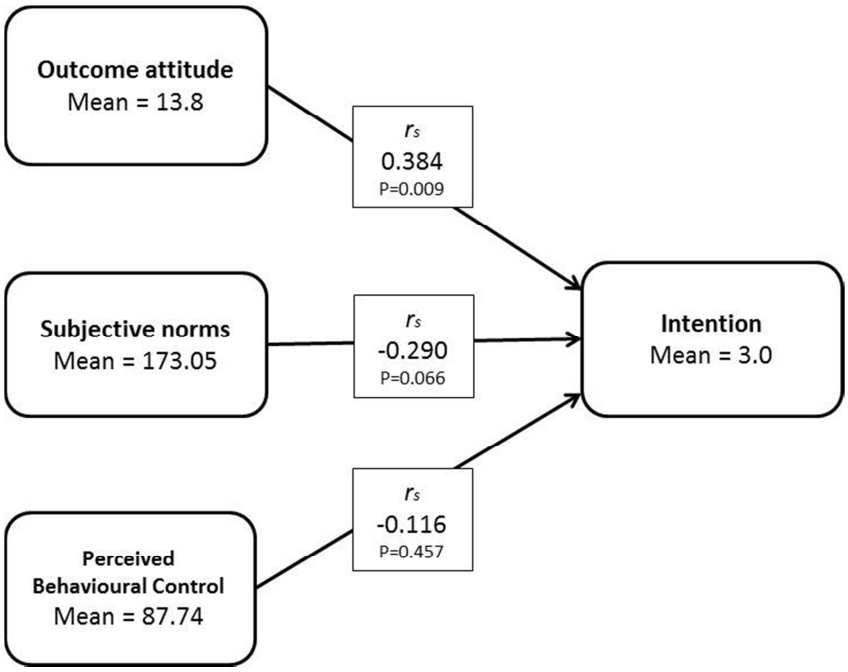

Figure 25: Relationships between intention to use homeopathic remedies (whole sample) and the three TPB theoretical determinants of intention.

Table 12 shows that there is a strong positive correlation (statistically significant) between SN and PBC, but neither is an apparently strong determinant of intention. There is also a moderate positive correlation between OA and SN (i.e. reversing the sign of the Rho coefficient), suggesting some collinearity between them. The reason for this might be that the positive attitudes of advisers, towards the outcomes of making more use of homeopathic treatments, is shared in common with peers. Under these circumstances, it would be expected that one or other of SN and OA would be found to be a significant driver of intent in the following regression model, but not both, i.e. the stronger determinant of the two will express the common variance in the model.

Table 12: Correlation matrix for attitude (OA), subjective norms (SN) and perceived behavioural control (PC) (Spearman's Rho).

	Outcome Attitude	Subjective Norms	Perceived Behavioural Control
Outcome Attitude ($\sum b_i$)	1.0		
Subjective Norms ($\sum b_i * e_i$)	-0.398 *P=0.013*	1.0	
Perceived Behavioural Control ($\sum b_i * e_i$)	-0.049 *P=0.757*	0.449 *P=0.005*	1.0

7.4 Cognitive barriers to, and drivers of, intent

Barriers and drivers of intent to use homeopathic remedies were identified by correlating intent with individual outcome attitude questions, as only this composite variable showed significant correlation with intent. A significant positive correlation between an attitude question and intention indicates a cognitive driver. A significant negative correlation indicates a cognitive barrier.

Table 13 shows that just 3 of the 6 attitudinal questions (i.e. attitudes to perceived outcomes of using homeopathic treatments) were significantly correlated with intent, with all showing relatively strong associations (i.e. r_s values of near 0.3 or greater), these being:

- A belief that homeopathic treatments work (positive view on efficacy) (Q19);
- A belief that homeopathic treatments would be effective in the case of mastitis (Q23); and,
- Disagreement with the view that use of homeopathic treatments might damage the professional reputation of the vet/adviser (Q28).

Questions Q7a_8 and Q28 have positive correlations with intent, because the scale of the variables (along with Q7a_7) have been reversed to be consistent with the other variables in the composite OA variable, which all express a positive sentiment towards homeopathic remedies. In broad terms, it would appear that the strongest driver of intent to use homeopathic remedies, from among this group of possible drivers, is a belief in their efficacy, either for individual diseases, or for diseases in general. Coupled with this is a belief that recommendation of homeopathic remedies to clients will not have negative consequences for the professional reputation of the vet/adviser. This attitude is also rooted in a belief in the efficacy of such remedies. Beliefs that homeopathic remedies are too time consuming to implement, or too expensive generate very weak (and non-significant) correlation coefficients, suggesting that while such attitudes might be barriers to intent they are very weak drivers indeed, either because very few people in the sample hold such beliefs, or because a larger number of people, while holding them, did not place much importance on such considerations. Note that the higher the mean rank score attached to each question in Table 13, the stronger respondents' agreement with the proposition contained in that question. Whether these attitudinal drivers of intent are the main determinants of intent will be assessed in the regression analysis reported below, where the relative contribution of these attitudinal drivers will be tested in conjunction with other classes of possible driver.

Table 13: Correlation of outcome attitude measures with intent.

Main TPB variables	Possible range of rank scores	Mean rank score	Correlation with intent r_s	P > *r*
(Q7a_7) Homeopathic treatment takes too much time	1 – 7	2.82	-0.028	P=0.860
(Q7a_8) Homeopathic treatment is too expensive	1 – 7	1.92	0.012	P=0.954
(Q14) Homeopathic treatment is an option for reducing use of antibiotics	1 – 3	2.00	0.183	P=0.208
(Q19) I think homeopathic treatments work	1 - 5	2.80	0.371	P=0.009**
(Q23) After homeopathic treatment of mastitis I think a good outcome would result	1 - 5	2.37	0.475	P<0.001**
(Q28) I am concerned that prescribing ineffective homeopathic treatments will damage my professional reputation	1 - 5	2.71	0.340	P=0.017**

Note: Italicised text indicates that these questions were dropped from the composite OA measure to maximise coherence.

7.5 Predicting the intent to use homeopathic treatments in the next year

The TPB variables identified as correlated with intent were used, together with farm and farmer descriptive socio-demographic variables, plus background attitudes, in a regression model to predict intention to use homeopathic treatments over the next 12 months. The results of this exercise are shown in Table 14. As the dependent variable in this case is based on an ordinal scale, and some of the independent variables have ordinal or binary scales, a logistic regression was undertaken.

Table 14 shows that while some outcome attitude measures are seen to be significantly correlated with intent in the correlation analysis, there was collinearity with SN as postulated and, consequently, SN has proved to be the better predictor of intent. In an effort to determine whether any of the components of the composite OA measure were good predictors, these were added into

the model after OA had been eliminated. All of these individual OA components were subsequently rejected from the model due to non-significance. It can be concluded from this result that attitudes, as measured by the relevant variables in this study, are not the strongest drivers of intent.

Of the three composite TPB measures available, only SN is found to be a significant predictor of intent. However, the sign of the BETA coefficient suggests a counter-intuitive result in this case. The positive sign suggests that an increase in the rank score of SN results in an increase in rank score of intent. What makes this result somewhat counter-intuitive is that higher rank scores on SN signal decreased approval of the use of the use of homeopathic treatments, suggesting that intent increases as peer disapproval increases. However, before putting any great emphasis on this result, the very small scale of the effect must be considered. The fact that the impact of the three TPB components is so limited strongly suggests that intent in this case is driven by factors that are not largely mediated through the TPB factors. It is recognised by most practitioners that factors may impact intent that are not fully mediated through the TPB dimensions. These factors might include socio-demographic characteristics, background attitudes, habits etc. Fortunately, the TPB approach also allows for the impact of such non-mediated factors to be assessed, using the regression model.

To explore the effect of possible non-mediated factors as drivers of intent, a list of 14 socio-demographic variables were also tested in the regression model. Two of these proved to be significant predictors of intent, these being:

- Q9_1 (adviser expectation of the level of their clients interest homeopathic remedies in future);
- Q11_1 (indicator of whether clients are asking for homeopathic treatments to a greater extent than in the past).

As Table 14 shows, there is a negative correlation between Q9_1 and intent, suggesting a decrease in expectation of prescription of homeopathic remedies in future with greater expectation of clients' interest in such remedies. This result would also seem to be counter-intuitive.

Table 14: Multiple logistic regression analysis to predict intent from TBP and socio-demographic variables

Independent variables	Estimate (β_0 / β_i)	Standard Error	P > χ^2
Intercept (1)	-2.718	0.869	0.002
Intercept (2)	-1.763	0.800	0.028
Intercept (3)	-0.051	0.751	0.946
Intercept (4)	0.921	0.773	0.233
SN	0.012	0.004	0.002
Q9_1	-1.563	0.546	0.004
Q11_1	1.873	0.936	0.045

Model fit: 2LogL (intercept and covariates) 113.48; Concordance 73.6%. N=41 of 49 (missing = 8).

A much more reasonable result is that if clients are increasingly asking for homeopathic treatments then the adviser has a greater expectation of prescribing such treatments in the next 12 months. While some results would seem to be more explicable than others, the general picture that seems to emerge is that the attitudes of vets/advisers themselves towards homeopathic remedies seem to have little bearing on their expressed likelihood of future prescription of such remedies. Rather, the main driver of intent would appear to be the attitudes of their clients, as distinct from other peers, evinced by the fact that if the vets/advisers perceive that the level of client interest in homeopathic remedies is growing, the likelihood of their needing to prescribe them also grows. This suggests a

very client-focused attitude in the adviser group, who are likely to prescribe homeopathic remedies on the basis of client demand, irrespective of their own personal views of the efficacy of such treatments.

7.6 Interim summary

The result of the TPB-analysis concerning the future use of homeopathy by veterinarians who are not familiar of homeopathy indicates that the likelihood of this future use depends on the level of demand from farmers. If farmers ask increasingly for homeopathic treatments then the veterinarians are more certain that they will be prescribing homeopathic treatments in the next 12 months, whatever their own beliefs about homeopathy. The results correspond with the self-perception of many veterinarians as service providers.

8 Economic implications of a homeopathic treatment

A frequently mentioned reason farmers to use homeopathy is that they believe a homeopathic treatment to be more cost efficient than a conventional one (see chapter 6). In order to investigate this statement, an economic questionnaire about homeopathic and conventional treatment was developed. Mastitis in dairy cows was the disease chosen for the economic investigation as homeopathic remedies are a common choice in its treatment. Three different treatment scenarios for mastitis were developed:

a) Mild case of clinical mastitis: change in milk (e.g. flakes, change in consistency and colour etc.);
b) Moderate case of clinical mastitis: change in milk and udder (e.g. swelling, nodes, pain etc.);
c) Chronic case of mastitis: moderate inflammatory disease associated with a fluctuating and persistent increase in somatic cell count.

The case of severe acute mastitis was not covered in this economic study due to the fact that homeopathic treatment of severe cases of mastitis purely by lay people should be excluded for animal welfare reasons (see Deliverable 4.1). Based on the WP9 report (see Deliverable 9.1), the following treatment steps were identified in a *lege-artis* use of medicine:

a) Anamnesis (including travel costs);
b) Clinical examination;
c) Selection of remedies;
d) Initial treatment;
e) Costs for homeopathic remedies or conventional medicine;
f) Follow-up checks.

For each single treatment step, cost ranges and average time durations were estimated. While there exists a scale of charges in Germany, whereas veterinarians in Spain and France are not limited to an official scale of fees so that they can determine the level of remuneration by themselves. Therefore, the economic questionnaire was translated into the national language and sent to local veterinarians (incl. homeopathic experts), who had already taken part in this survey. Costs for laboratory analysis of milk were not taken into account.

8.1 France

Due to the fact that in France, veterinarians determine the level of fee themselves, only rough estimations can be provided. In general, in mild cases of mastitis veterinarians are not called to farms and farmers treat the animals by themselves. This applies both to homeopathic and to

conventional treatment; in both cases only remedies for mastitis treatment were prescribed. The only difference between homeopathic and conventional treatment is that in the case of homeopathic treatment, sometimes a follow-up check takes place. The situation is similar to conventional treatment of chronic mastitis; whereas evidently only conventional products are prescribed. In contrast, homeopathic treatments in the case of chronic mastitis are often performed in a more comprehensive way. In general, cases of moderate mastitis are treated with homeopathy and conventional medicine more thoroughly. However, the respondents stated that a treatment follow-up check sometimes takes place when homeopathy is used, but never in the case of conventional treatment. The largest element in the cost of conventional treatment is the cost of medicine, whereas the process of anamnesis and remedy selection are the most cost intensive items in homeopathic treatment.

8.2 Germany

In contrast to France and Spain, a scale of fees exists for veterinarians in Germany ("Gebührenordnung für Tierärzte", GOT). That means that German veterinarians must adhere to national rules at least to some degree. However, no regular control measures take place. The scale of fees contains a list, in which every single step of conventional or homeopathic treatment is described and linked to a price which the veterinarian should charge from the client. However, in spite of this national regulation, many differences between veterinarians exist as the charges can be adjusted to account for extra labour, time of day or a veterinarians' experience. Therefore, only a rough estimation of costs for Germany can be provided too. For this economic model, the minimum rate was used.

Difficulties in calculating treatment costs exist in different areas. It begins with the estimation of travel costs. According to the GOT, travel costs are calculated depending on the distance to the farm. Moreover, farmers do not have to pay for single globules (prices are in the single digit cent range), but for complex remedies, low potencies and homeopathic injections. As a general rule, the assessment of treatment success is not performed for any of the given scenarios (mild, moderate and chronic mastitis), except in the case of disturbed general condition or if no improvements occur within the next few days. The most challenging case is chronic mastitis, because the symptoms are not numerous and mostly mild. Thus farmers / veterinarians do not make much effort to treat the condition and instead the udder will often be dried-off.

8.3 Spain

In Spain, the situation is similar to France; no scale of charges for veterinarians is available either. The costs for treatment are calculated individually and differ from case to case. Therefore only rough cost estimations can be made.

According to the respondents, every homeopathic consultation costed from 44 € to 91 €, plus costs for remedies. In general, a follow-up check was neither performed and nor expected by farmers. It is assumed that they would usually switch to conventional treatment if the homeopathic treatment was not successful. If a second farm visit in connection with the same treatment case takes place, 10 € to 20 € would be charged. A mild or moderate case of clinical mastitis was usually treated by the farmers themselves with conventional remedies. Only in cases of highly acute mastitis did professional treatment by a veterinarian takes place. Conventional treatment of chronic mastitis was rare; many farmers did not treat this level of the disease during the lactating period. Information regarding the average duration of conventional treatment was not available.

8.4 Cost-estimations

Treatment

The results of the cost-estimations are summarised in Table 15. Due to the different cost factors included in calculations (varying considerably between countries and between homeopathic and conventional treatment) only a very rough estimation of the range of total costs for the treatment of mastitis can be provided. This variation in costs is mostly due to the differences between the costs for remedies and (not) undertaking follow-up checks.

Table 15: Costs for conventional and homeopathic treatment for mastitis

		Homeopathic treatment		Conventional treatment	
		Average duration (in min.)	Cost range (in €)	Average duration (in min.)	Cost range (in €)
Mild acute mastitis	France	**2-15**	**2-10**	**0**	**13-16**
	Germany	**2-15**	**31-69**	**0-15**	**24-64**
	Spain	**17-36**	**44-81**	**-**	**10-15**
Moderate acute mastitis	France	**25-77**	**34-78**	**23-61**	**154-258**
	Germany	**15-55**	**36-74**	**10-50**	**24-62**
	Spain	**17-46**	**45-91**	**-**	**25-30**
Chronic mastitis	France	**25-77**	**34-78**	**0**	**75-140**
	Germany	**30-50**	**54-91**	**0-15**	**24-64**
	Spain	**17-38**	**45-91**	**-**	**80-100**

The figures show no clear trend when comparing costs between homeopathic and conventional treatment. In France, the costs for homeopathic mastitis treatment of mastitis were clearly lower compared with the conventional treatment strategy. In Germany, homeopathic treatments can be expected to be more or less on the same level as conventional ones. In Spain, the homeopathic treatment strategy in the case of mild and moderate forms of mastitis seems to be more expensive than the conventional strategy, while the costs seem to be lower for the chronic form of mastitis.

Costs of milk samples

For an expedient treatment of mastitis, either homeopathic or conventional, it is necessary to use laboratory milk analysis to identify the type of bacteria involved in the infection present in the udder. The diagnostic procedure and the costs of the milk sample diagnostic differ considerably between the three countries (see Table 16).

Table 16: Costs for laboratory milk analysis (one udder quarter)

Costs for	France	Germany	Spain
Identification of pathogen	35-50 €	15-20 €	6-10 €
Antibiogram[Ω]	15-25 €		
Total	**50-75 €**	**15-20 €**	**6-10 €**

Due to the high costs of milk sample analysis in France, only selected animals with clinical mastitis are generally tested when mastitis occurs in a herd. French milk laboratories calculate the analysis costs (by default) for each quarter milk sample, whereas in Germany, it mostly usually does not make a price difference whether one or all udder quarters are analysed. While the costs for laboratory milk analysis are clearly lower in Germany and Spain, this does not necessarily mean that the comparably lower prices led to regular and standard monitoring of milk samples before treatment.

While the costs for homeopathic remedies only contribute slightly to the total treatment costs, the time spent by a veterinarian in implementing the various parts of the whole treatment procedure and the salary he/she claims to cover the resulting labour seem to be the most relevant cost drivers. When looking at the comprehensive list of measures included in an accurate *lege-artis* treatment method, it is seen that most of these are only partly implemented in farm practice. Thus, farmers often try to spare expense by reducing the quantities they select from the total catalogue of possible measures the veterinarians offer. This means farmers carry out what they feel able to, without a veterinarian.

Reducing the economic concerns of treatment mainly to the size of the bill (loss aversion) that has to be paid to the veterinarian seems to be quite questionable. This narrow perspective not only ignores the high risk of weak therapeutic effects, the consequences for animal health and welfare and the associated extended suffering for the farm animals. The short-sightedness also ignores relevant economical aspects: particularly the negative side effects of unsuccessful treatment on the productivity of diseased farm animals, extended calving interval, the higher risks for the development of other diseases, the risks of pathogen spread throughout the herd, and last but not least the increased risk of culling.

9 Discussion on the use of homeopathy while considering different perspectives

The results of the different questionnaires revealed that the use of homeopathic products in France, Spain and Germany is practised very heterogeneously and differs considerably from farmer to farmer, veterinarian to veterinarian, and country to country. The reasons behind this heterogeneity are manifold. Amongst others, they range from the complexity of this treatment approach, to the huge variety of different farm conditions where homeopathy is employed, and (last but not least) to the very diverse perspectives and interests the many stakeholders hold.

In the first place, homeopathic products are remedies and as such they are a means to an end in order to support diseased organisms to recover. However, there is not just one but a further mixture of purposes, aims and secondary effects which are weighted differently depending on the particular perspective to a high degree. While the issue of the efficacy of homeopathic products has been reviewed recently in a comprehensive report (Deliverable 9.1), the heterogeneous attitudes towards alternative remedies within the scientific community have been outlined in an additional report (Deliverable 9.3). The current report focusses primarily on the circumstances in which remedies are used and on the attitudes of different stakeholders: farmers, and veterinarians. For this purpose, several questionnaires were addressed to different target groups with partly overlapping topics.

9.1 Farmers' perspective

As owners of the farm animals, farmers bear the main responsibility for their well-being. Apart from being responsible for organising an adequate nutrient supply and appropriate housing and hygienic conditions, the farm animals' 'carers' are the first who perceive if farm animals' behaviour deteriorated and where signs of clinical and subclinical diseases exist. They evaluate whether signs indicate the need for immediate or delayed actions. They decide which animals should be treated or not and when. They also decide which veterinarian is consulted if at all, and last but not least: to what degree external professionals are allowed to invest time and money in curing the diseased animals. This question is related to both alternative and conventional treatment.

The farmers who wish for their animals to be treated with alternative remedies are confronted with the fact that there are only a few veterinarians with expertise in homeopathy, with numbers varying considerably between regions. A survey of the situation in the different European countries is outlined in the report on the legal conditions and factual findings on the use of homeopathy in Europe (Deliverable 4.4). As a consequence, farmers who are interested in the use of alternative treatments seek advice from non-veterinary practitioners in countries like Germany where this profession is widespread or they try to manage the homeopathic treatment by themselves. The latter is facilitated by the ready availability of homeopathic products - either from pharmacies or the internet - and by the many training opportunities offered to lay people.

There is no European or national legislation that prohibits farmers and non-veterinarians making use of homeopathic products, except for *Colchicine* and *Aristolochia.* Although forbidden, they have been found in the stable pharmacies of 11 out of 64 farms visited. Another conflict with the law is the fact that only veterinarians are allowed to make use of drugs dedicated to humans for farm animals. However, farmers are often reluctant to consult the vet because of the additional costs. Furthermore, where three conventional or antimicrobial treatments are given to the same animal within one year, a loss of its organic status and the associated products occurs, resulting in financial loss to the farmer. Therefore, the consultation of a vet and the use of conventional products are often bypassed.

Some farmers may claim to have gathered their own knowledge and experience on how to deal with diseased animals. However, most of the farmers are not aware of the principles of homeopathy and do not have appropriate expertise in anamnesis, diagnosis, decision about the value of and method of treatment, selection of remedies, use of remedies, specific cases of treatment, and monitoring treatment success. Often, conventional products are just replaced by homeopathic remedies without being aware of the cause-effect relationships and the principles of homeopathy. Furthermore, to implement a successful treatment strategy, thorough documentation is needed. However, farmers are very reluctant to do so because they are afraid that they might criminally implement themselves with these documents when stable pharmacies are inspected by official veterinarians. On the other hand, farmers would like to reduce the use of antimicrobial medicine and are in search of alternatives. Many farmers even feel prompted by the Council Regulation (EC) No. 834/2007 on organic agriculture to treat diseased animals with alternative medicine and by the wishes of many consumers to reduce the use of antibiotics in food-producing animals. Thus, they feel they are not being taken seriously enough by veterinarians in their wish for support during the homeopathic treatment and thus seek support from non-veterinary practitioners or treat by themselves.

However, it is often ignored that the EC-Regulation on organic agriculture also claims that the farmer should strive for immediate and successful treatment to prevent the extended suffering of

diseased animals. Documentation on the prevalence of production diseases is seldom carried out and thus an overview of the development of diseases in the herd is often missing. On the other hand, there is no control or level of monitoring which would force farmers to both follow the rules and organic principles to maintain a high level of animal health. Farmers can not currently be accused of improper use of medicinal products and thus do not have to face the risk of any penalties if they do not treat immediately and successfully.

Obviously, options to reduce production costs by homeopathic treatments (e.g., self-medication, low costs for remedies, no withdrawal period, etc.) seem to play an important role for farmers. In this context, an aversion against costs that are perceived as losses (Kahneman, 2013) might play a crucial role in trying to reduce the veterinarians' bill without considering the possible consequences in the long run. As outlined in workpackage 5, farmers are often not fully aware of costs of failure associated with unsuccessful treatments and animal diseases; encompassing (among others) the great risk of a strong reduction in productivity and increased culling rates. In general, these costs far exceed the costs of treatment

9.2 Perspective of non-veterinary practitioners

The professional practice of non-veterinary practitioners is often not clearly defined and not regulated by law (see Deliverable 4.4). Thus, no reliable data regarding the amount of non-veterinary practitioners are available as every person is allowed to treat animals with homeopathic remedies regardless of the type of training, state examination or the lack of basic homeopathic education (Bundestierärztekammer Berlin, 2007). However, due to the lack of knowledge about drugs law, non-veterinary practitioners do not always notify the proper authorities when they use restricted remedies. The medicinal law does not demand regular inspections of non-veterinary practitioners; non-routine inspections only take place after notification by animal owners or veterinary inspection offices. The State Office for food security in Germany is aware of repeated violations of national medicinal law by non-veterinary practitioners in the field of food-producing animals (Kübler, 2015).

Experienced non-veterinary practitioners can claim that they have more experience in dealing with diseased animals using homeopathy than farmers have. While they would not claim that they are as qualified as a veterinarian, they might claim to know much more about the issue of alternative treatment than veterinarians do. For non-veterinary practitioners, alternative treatments offer a welcome opportunity to make a living from treating farm animals without being a veterinarian. Thus, they open up a market, driven by increasing demand by farmers, while the veterinarians are only partly seen as serious competitors. The market for healing professions in agriculture does not work according to the rule that those with the highest expertise and the highest treatment success are always favoured in the first place by farmers. Instead, often those who are less expensive while giving the impression that they do a better job than the farmers themselves are favoured.

In general, non-veterinary practitioners are assumed to be more aware of the principles of homeopathy than farmers and may provide a better access to homeopathic remedies. Although non-veterinary practitioners are not allowed to rededicate drugs either, farmers might be relieved that they can delegate the irregularities and administrative functions to someone else. In the case that treatment does not succeed, the veterinarian might be seen as a last resort in dealing with cases that have neither been solved by the farmer nor by a non-veterinarian. If even the veterinarian is not able to treat the diseased animal successfully, the farmer might think that this is due to the

type and severity of the illness while ignoring the more obvious reason that the lack of success might be due to bad and/or delayed treatment.

9.3 Perspective of veterinarians

The education of veterinary practitioners includes inter alia, a comprehensive study of the physiological and pathological processes occurring within diseased animals and the pharmaceutical options (and limitations) to influence these processes. In the first place, the profession of veterinarians is thus aimed at treating animals successfully, contributing to a decrease in the prevalence of production diseases and associated suffering. However, veterinarians are not authorized to treat farm animals in ways they might believe to be most effective. As service providers, they must follow the considerations and decisions of their farmer clients regarding: when diseased animals should be treated, which treatment method should be preferably used, and how much expenditures the veterinarian is allowed to invest.

Veterinarians act both as practitioners in emergency cases and as advisors, offering information and support to the farmer in gaining a decision about the most appropriate treatment thus trying to strike a balance between the interests of the farmer and his own interests. Additionally, they are also requested to take into account the interests of the farm animals regarding easing suffering and the interests of consumers with respect to food safety issues. Veterinarians compete with other advisors and practitioners for the farmers' favour. Veterinarians might claim to provide the best expertise but they are also the ones with the highest bill. The treatment is governed by what farmers believe is the best cost-benefit relationship and return of investments which will emerge from the various offers and strategies.

Thus, veterinarians are captured in various conflicts. They cannot ignore the specific attitudes and beliefs of their clients without compromising their own income. The results of the TPB-analysis (chapter 7) support the hypothesis that many veterinarians perceive themselves as service providers. Hence, veterinarians must have seen that farmers are interested in alternative treatments. However, they often are reluctant to do courses in alternative medicine for various reasons. In contrast to non-veterinary practitioners, there are lengthy and detailed training requirements for veterinarians who would like to gain an additional specialised qualification in naturopathic treatment, e.g. training time from three to four years in total, proof of a minimum of 120 training hours, obligatory course contents and case conferences etc. Therefore, it is not surprising that only 44 veterinarians for livestock in Germany have gone through a thorough homeopathic education (Sächsische Landestierärztekammer, 2015). As the efficacy of homeopathy is questioned by scientists to a high degree, veterinary homeopaths are facing the risk of being marginalised within the profession. As shown in the economic estimations, there is not much money to be earned. Thus, veterinary homeopaths seem to act more from conviction and not from expectations of a good income. The majority of veterinarians who make use of homeopathy treat farm animals with approved indications or complex remedies. Only a small group of homeopathic "experts" repertorize clinical symptoms in the classic sense of homeopathy.

An increasing number of farmers seem to want their animals to be treated by their local veterinary practitioner using alternative medicine. Even so, the number of farmers interested might not be enough, their readiness to pay adequately for labour too low and the belief of the veterinarian in the effectiveness of this treatment strategy limited. At the same time, farmers often try to apply homeopathic products themselves or ask a non-veterinary practitioner to use cheap homeopathic

treatment. These and other reasons, seen separately or in combination, are significant enough to prevent veterinarians from investing time and money to become a specialist in homeopathy.

9.4 Animal health and welfare issue

Adaptation to changes and disturbances in the environment requires regulations on different scales within the organism and follows a common purpose: to survive as long as possible. Signs of metabolic and fertility disorders as well as subclinical and clinical diseases indicate varying degrees of an overstressed ability to adapt (Sundrum, 2015). When disorders occur, it is an illustration that animals are having difficulties in coping with external and internal conditions, endangering their own capacity to survive. As farm animals cannot escape their living conditions, their ability to cope depends on the extent their environment impacts upon them, on their ability (or inability) to maintain or re-establish a homeostatic state, and on the support provided by the farmer by way of improving the living conditions of the farm animals and treating diseased animals appropriately and successfully.

Production diseases are multi-factorial from their nature. Different variables and prerequisites on the farms and in the herd form a network of environmental variables which, as a whole, has an impact on the capacity of the farm animals to adapt to their respective living conditions. Thus, it is not possible to deduce a simple causality between single factors in the management, the occurrence of diseases in single animals and the probability of success in treatment. Any stimulus (external or internal) that challenges homeostasis can be viewed as a stressor. Changes in biological function occur as the animal attempts to respond to stressors and associated challenges. When trying to support the animal in dealing with stressors and in regaining homeostasis by self-regulating processes, it is essential to remove the stressor(s) or at least minimize their impacts and to stimulate the self-healing process with an appropriate stimulus. Considerable differences exist in the treatment strategies between the use of antibiotics and homeopathy. Amongst others, this is due to the fact that the initial intent in reducing the number of pathogens living in the tissues or the blood (stressor by antimicrobial effects), whereas homeopathy products are primarily administered to strengthen the self-healing capacity of the animals. Whether or not these strategies work depends not only on the efficacy of the remedies; which is often questioned in the case of homeopathy (see Deliverable 9.1). It also very much depends on the suitability of the remedy to the very specific types of interactions between the stressor and the animal and (last but not least) on the capacity of the animals to react to the stimulus. This complexity is seldom overlooked by the farmer. However, even qualified veterinarians often have difficulties in thinking through the complexity of interactions on the various levels. If they wish to gain a high success rate when treating, they require valid information on the characteristics of the diseased animal, its living conditions, the possible stressors and (above all) they need time. Unfortunately, information and time are often not adequate. Moreover, the initiating therapy is often delayed, which can be expected to clearly reduce the probability of successful healing. Additionally, stressors in the environment (which might be contributed to the reduced capacity of the diseased animals to adapt appropriately) are often neither removed nor is their impact substantially reduced (for instance in the case of suboptimal hygiene conditions or imbalanced nutrient supply).

The on-farm assessment of the environmental variables affecting homeopathic treatment revealed suboptimal hygiene conditions on many farms. Thus, structural and non-structural variables on the test farms were often far from being optimal for the early detection disease in animals. It is likely that many infections could develop into chronic disease, thus making it very difficult to treat them successfully - whatever the treatment strategy chosen. Due to the fact that unsuccessfully treated

diseased animals go on to suffer for a long time, the issue of animal welfare cannot be ignored. Furthermore, when diseased animals cannot be rid of the pathogens they carry; unsuccessful treatment also increases risks for public health. There are strong reasons to suspect that farmers who treat diseased animals by themselves (with homeopathy or allopathy) may put animal health and welfare at risk if they do not first focus on treating early and effectively.

9.5 Consumers' and market perspective

When asking consumers about their wishes regarding animal products, they often state that animals should be kept in housing conditions appropriate to the animals' health and welfare. Animals should be able to comfortably pursue natural behaviours. Additionally, antibiotic use should be reduced to a minimum to prevent residues and the development of antibiotic resistance. Therefore, many consumers favour the use of alternative remedies in farm practice. As revealed by various questionnaires, these are wishes particularly expressed by consumers of organic products (Sundrum, 2014). Retailers are fully aware of consumers' wishes and often advertise their products accordingly. A recent advertising campaign in Germany even emphasized the claim that their dairy animals were treated with homeopathy. Whilst highlighting single aspects of the promoted products, retailers do not forget to emphasise that the added value in the products can be attained by just paying a small premium.

Unfortunately, the mental pictures advertising writers and consumers hold in their heads differ from the reality on farm level. Particularly, high prevalence of production diseases in organic livestock production (which in general do not differ from those in conventional production) indicate that organic farmers are not successful in conferring higher animal health status, although the quality of housing conditions on organic farms generally clearly exceeds those of conventional production (see Deliverable 2.5). Thus, there is obviously a fundamental conflict between (a) attaining a high animal health and welfare status; and (b) the difficulties farmers have in keeping animals healthy and in establishing a successful treatment strategy for illness.

The conflict casts a poor light upon the organic producers which fail to ensure a high level of animal health and welfare in organic dairy production, thus not meeting consumers' demands and not justifying the premium prices consumers are still willing to pay for organic dairy products. However, it has to be taken into account that the treatment success of diseased animals, either with homeopathic or conventional remedies, is only one of various aspects relevant for achieving a high level of animal health and welfare.

The possible inappropriateness of the living conditions and of on-farm treatments cannot be discussed adequately while focussing on means of production and remedies used. The context in which production takes place must also be considered. The organic market does currently not distinguish between products deriving from healthy cows or those from cows which suffer from clinical and subclinical diseases. By offering the same price for the raw material, regardless of quality, the market favours farming strategies which go for a minimum of expenditure and attempts of treating sick animals. On the other hand, farmers who strive for a high level of treatment success are facing increasing levels of labour and expenditure without being honoured by premium prices. Farmers can only be expected to implement appropriate measures for disease prevention and treatment if the necessary labour is rewarded adequately. The market does not provide a framework for farmers willing to improve disease prevention and treatment. Instead, it promotes unfair competition between organic farmers. The market does not reward producers who take time and money to keep their animals healthy (for example in the form of certified products from healthy

animals). It does not punish failure to meet good animal health and welfare and supports the situation of unfair competition. In contrast, fair competition between organic farmers for the most efficient strategy to achieve an acceptable level of production diseases would offer a real incentive to farmers and thus would be the best strategy to improve animals' treatment success. It seems that currently consumers are not fully aware about the conflicts arising between different aims, values and interests. Consumers cannot be expected to fully understand livestock production and the complex processes associated. Without political conflict management at a high level, the commercial model and business principles of organic agriculture are at a high risk of eroding; due to misleading advertising by retailers and unfair competition between farmers who offer their products under the same organic label (and the same premium price) but with quite different qualitative traits.

10 Concluding remarks

The current study has attempted to bring some light into the shadowy area of homeopathic and conventional remedy use on organic dairy farms. Although the investigations were to a limited number of farms and to respondents in three European Countries, it has become obvious that the situation is quite complex. Treatment is practiced very heterogeneously between farms and countries. Hence, significant growth in the number of farms visited and respondents questioned could well increase the degree of heterogeneity. A conclusion can thus not be drawn using mean value calculations; a meta-level examination is required.

The general situation seems hard to comprehend and clarify; both for the implementation and effectiveness of treatment. Numerous remedies are used to treat farm animals with differing symptoms, differing ability to adapt to stressors from the living conditions, and a differing ability to react to the stimuli in the applied remedies. Treatments themselves are administered: at different time intervals from the first onset of symptoms, with different expertise levels and variations in reliability. Moreover, treatment is accompanied by various and often insufficient follow-up checks. The complexity of interactions between the various internal and external variables involved suggests that whether a homeopathic treatment is effective cannot be reduced to single factors, such as the efficacy of remedies in a standardised and randomized clinical control trial. Whether or not treatment measures enables healing also depends on the appropriate selection of a remedy, the ability of the animal to react to the remedy and on the environmental context where treatment takes place. Any form of treatment should be administered to support the organism in coping with the stressors. However, how the treatment issue is dealt with really depends on the various perspectives of the stakeholders involved. The results of the questionnaires showed that farmers and veterinarians seem to be rather self-referential in their way of thinking and acting in the case of illness. Each stakeholder seems to pursue his/her own way of thinking of what might be appropriate or not. Thus, the results of the study revealed the lack of a clear reference level which could serve as a road map for the implementation of treatment.

The heterogeneous situation in farm practice makes it nearly impossible to predict the outcome of treatment and to directly assess the possible impacts of treatment; either with homeopathic or conventional remedies. A reduction of internal and external stressors to put farm animals in a better position to adapt and better rates of treatment success for illness requires appropriate risk management. Only a deductive approach can establish whether the well-intentioned use of remedies in a farm situation serves the purpose of healing diseased animals appropriately. This approach would follow the line of thinking that the current state of production diseases is the outcome of the farm specific interactions between farm animals and their living conditions.

Production diseases develop within a farm system as the result of interactions between multifactorial external and internal stressors which the farm animals have to deal with. They indicate that the animals' ability to adapt to variations in their environment is overstressed. The way animals are treated is an important factor in the comprehensive issue of production diseases in organic agriculture. The high prevalence of production diseases in organic dairy farming indicates that the farm animals and their intrinsic needs seem to be not considered appropriately. Thus, conflicts between the interests of stakeholders are often resolved at the expense of the farm animals and their well-being. The problems which emerge cannot only be solved by relying on stakeholders' motivation but require regulatory measures at a higher level.

Article 24 (veterinary treatment) of the Commission Regulation (EC) No 889/2008, laying down detailed rules for the implementation of Council Regulation (EC) No 834/2007 on organic production, prescribes (in a short version) that sick animals shall be treated immediately with remedies which aid the elimination of suffering or distress. The legal regulations and the increasing preference for alternative treatments cannot claim to have been successful in contributing to a lower prevalence of production diseases and higher treatment success. While leaving ample room for interpretation about priorities, the regulations do not solve conflicts. They are even laying the foundation for conflicts between different aims and stakeholders, often to the expense of animal health and welfare. The EC-Regulations on organic livestock production should thus be reconsidered accordingly.

Neither the treatment nor the remedies used in the treatment are an end in themselves but a means to an end. As such, both should be assessed according to how well they meet their purpose. If the achievement of targets associated with treatment and the effectiveness of the treatment itself are not regularly investigated, either on the farm level or on the superordinate level of organic farming, those responsible cannot pretend that they are doing something serious about the occurrence of diseases. If no control measurements take place, treatment measures are at a high risk of becoming symbolic; a pretence of action without evidence of effectiveness.

A functional approach is needed which can only be implemented retrospectively, starting with monitoring of prevalence and incidence of production diseases on farm level. With regular monitoring, it is possible to focus on those farm situations which considerably deviate from the median values and to proceed with further in-depth examinations of how to reduce stressors and administer the most appropriate treatment strategy to support healing and prevent extended suffering in diseased farm animals. From this starting point, each treatment can be assessed as to its contribution to a reduction in the level of production diseases; where thorough documentation of the disease, the treatment measure and the course of treatment takes place.

11 Glossary

Antibiogram	An antibiogram is the result of a laboratory testing for the sensitivity of an isolated bacterial strain to different antibiotics.
Approved (proven) indications	The homeopathic remedy is chosen on the basis of specific symptoms / specific disease without consideration of individual homeopathy symptoms.
Classical homeopathy	This is a form of homeopathy in which the remedy consists a substance that most closely matches the essence of the malady and the totality of symptoms.
Clinical homeopathy	Clinical homeopathy is a discipline centred on symptoms that are strong indicators that a specific remedy would be most effective for a disease. The use of clinical homeopathy concentrates on affinities for the disease, organ, or tissue as indicated by the symptoms and the specific remedy. Clinical homeopathy contrasts with classical homeopathy in that the classical viewpoint looks at the totality of symptoms rather than the disease entity.
Complex remedies	Complex remedies are a system of homeopathic remedy that has more than one substances combined together in one dosage form
Homeopathic potencies	The potency defines to which extent the original substance or mother tincture is diluted (= homeopathic dilution).
Materia medica	The Materia medica is a complete published list of homeopathic remedies; a collection of remedy pictures of different substances (Steingassner, 2007; Murphy and Klendauer, 2010).
Non-veterinary practitioner	This is a non-veterinary practitioner in the field of alternative treatments, who treat animals (pets and food-producing animals) without a veterinary approbation. The exercise of profession is not regulated by law. (in German: “Tierheilpraktiker”)
Lege-artis concept	Doing something exactly according to fixed and approved rules
Precondition	A condition that must exist or be established before something can occur or be considered. Preconditions represent prerequisites under which management measures can be implemented and determine the options and the result for realization.
Rededication of remedies	If there is no suitable veterinary medicine authorised in the country, the veterinarian is allowed to use other medicinal products (veterinary products for other animals, human products, imported medicines, self-made medicines etc.) under consideration of the cascade (European Commission, 2004)
Repertorization	This is not only a mechanical process of counting rubrics and totality marks obtained by a remedy; it also includes the logical steps to reach the proper repertory and finally differentiating the remedies with the help of Materia medica.
Repertory	A reference book which lists homeopathic symptoms in alphabetic order and the remedies used to treat them (Kent and Holzapfel, 2008; Schroyens, 2014).
Single remedies	No matter how many symptoms are examined, only one remedy/substance is taken, and that remedy will be aimed at all those symptoms.
Withdrawal period/time	Withdrawal period is the time required after administration of a drug to a food-producing animas needed to assure that the pharmaceutical residues in food (meat, milk, egg) is below a determined maximum residue limit (MRL).

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13 Annex

13.1 Annex I – Questionnaire on farmers' background

1. **Lactating cows - Type of housing:**
   - ☐ Loose stall
   - ☐ Tie-stall
   - ☐ Always outside

2. **How old are you?**
   - ☐ < 26
   - ☐ 26-34
   - ☐ 35-44
   - ☐ 45-54
   - ☐ 55-64
   - ☐ > 64

3. **Gender of farmer?**
   - ☐ Male
   - ☐ Female

4. **What is your role in the dairy enterprise?**
   - ☐ Owner
   - ☐ Paid herd manager
   - ☐ Other paid position
   - ☐ Other: _____

5. **Are you the main decision maker relating to the health of your dairy herd?**
   - ☐ Yes
   - ☐ No

6. **How many years do you go to school?**
   Note: in school – primary, secondary

   Total years: ____

7. **What is your agricultural education?**
   - ☐ None agricultural education
   - ☐ Vocational / technical (with formal qualification)
   - ☐ Higher (university level; with formal qualification)

8. **Are you active involved in a farmers' group?**
   Note: If they say "Yes", ask in which group they are involved

   - ☐ Yes: _____
   - ☐ No

9. **Are you a member of an organic farmers association?**
   - ☐ Yes: _____

☐ No

10. Which dairy cow genetics do you use and what is the predominant breed?

Note: left column: all breeds on farm – More than 1 answer is possible. Right column: only the predominant breed – Only 1 answer is possible

Breeds they use	Breed	Predominant Breed
☐	Holstein (b/w)	☐
☐	Holstein (red)	☐
☐	Swiss Brown	☐
☐	Fleckvieh/Simmental	☐
☐	Jersey	☐
☐	Swedish red	☐
☐	Montbélliarde	☐
☐	Normande	☐
☐	Other: _____	☐

11. How many cows and calves do you have?

Total number of cows: _____
Total number of calves: _____

12. What is the manpower dedicated to dairy cows?

Total number of full-time equivalents: _____

13. How long do cows have access to pasture on average?

Days per year: _____
Hours per day: _____

14. How long do cows have access to an outdoor run on average?

Days per year: _____
Hours per day: _____

15. What are the main reasons for involuntary culling for your farm?

Note: 1 for the first answer, 2 for the second etc.

Fertility disorders: _____
Udder diseases/mastitis: _____
Claw diseases/Lameness: _____
Metabolic disorders: _____
Other: _____ _____

16. Do you participate in a herd health prevention programme?

Note: If "Yes", note disease and organisation.

☐ Yes: Disease: _____ Organisation: _____
☐ No

13.2 Annex II – Questionnaire on farm management

Housing tour - Stable for lactating cows

1. Treatment

Note: multiple options are possible

- Fixation options:
  - ☐ No fixation options
  - ☐ Tether rope
  - ☐ Feed fence
  - ☐ Treatment stand
  - ☐ Other:_____
- Boxes for diseased animals: Number of boxes: _____
  - ☐ No boxes
  - ☐ Same boxes as for calving animals
  - ☐ Different/separate boxes

  → Cleaning:
  - ☐ No cleaning
  - ☐ Clean swept
  - ☐ With cold water (e.g. garden hose, bucket etc.)
  - ☐ With high pressure cleaner – cold water
  - ☐ With high pressure cleaner – hot water (min. 65℃)
  - ☐ After each use
  - ☐ Other:_____

  → Disinfection:
  - ☐ No disinfection
  - ☐ With lime/chalk
  - ☐ Other chemical-synthetic disinfectants (e.g. alcohols, acids, bases etc.)
  - ☐ Physical disinfection (e.g. flaming, UV etc.)
  - ☐ After each use without pre-cleaning
  - ☐ After each use with pre-cleaning
  - ☐ Other:_____

- Boxes for calving animals: Number of boxes: _____
  - ☐ No boxes
  - ☐ Same boxes as for diseased animals
  - ☐ Different/separate boxes

  → Cleaning:
  - ☐ No cleaning
  - ☐ Clean swept
  - ☐ With cold water (e.g. garden hose, bucket etc.)
  - ☐ With high pressure cleaner – cold water
  - ☐ With high pressure cleaner – hot water (min. 65℃)
  - ☐ After each use
  - ☐ Other:_____

  → Disinfection:
  - ☐ No disinfection
  - ☐ With lime/chalk
  - ☐ Other chemical-synthetic disinfectants (e.g. alcohols, acids, bases etc.)
  - ☐ Physical disinfection (e.g. flaming, UV etc.)
  - ☐ After each use without pre-cleaning
  - ☐ After each use with pre-cleaning
  - ☐ Other:_____

2. Storage facilities/ environment for remedies

Note: multiple options are possible

• Separate room as pharmacy:	☐ Yes	☐ No
• Homeopathics:		
→ Dry?	☐ Yes	☐ No
→ Dark?	☐ Yes	☐ No
→ Cool? (not over 25℃)	☐ Yes	☐ No
→ Electromagnetic waves near? (e.g. microwaves, telephone, computer etc.)	☐ Yes	☐ No
→ Strong odors near? (e.g. camphor, menthol, peppermint, coffee)	☐ Yes	☐ No
→ Expired remedies? **Note: How long do you store your homeopathics? (max. 5 years)**	☐ Yes	☐ No
→ Package leaflet available? **Note: Only complex remedies**	☐ Yes	☐ No
• Conventional remedies		
→ Dry?	☐ Yes	☐ No
→ Dark?	☐ Yes	☐ No
→ Cool? (e.g. fridge, not over 25℃) **Note: Look at remedies what is needed!**	☐ Yes	☐ No
→ Expired remedies?	☐ Yes	☐ No
→ Package leaflet available?	☐ Yes	☐ No

3. How many homeopathic and allopathic remedies do you store at your housing pharmacy?

Total number of stored homeopathic remedies: ____
Total number of stored "over the counter"/freely available conventional remedies: ____
Total number of stored pharmacy restricted conventional remedies: ____
Total number of stored prescription conventional remedies: ____

Stockpiling:

	For conventional treatment:		For homeopathy:
	Antibiotics		Arnica
	Mastitis injectors for lactation		Rhus-Tox
	Mastitis injectors for drying off		Aconit
	Anti-inflammatory drugs		Belladona
	Hormones (oxytocin, gestagene etc.)		Bryonia
	Ointments (udder, limb etc.)		Phytolacca
	Analgesics		Apis
	Antiparasitic agents		Hepar Sulfur
	Sedatives/Hypnotics (Xylazin, Ketamin etc.)		Sepia
	Infusions (Glucose, Calcium etc.)		China
	Vaccinations		Carbo Vegetabilis
	Other:		Nux-Vomica
			Calcarea carbonica
			Calcarea phosphorica
			Silicia y phosphorus
			Complex: Traumeel
			Other:

4. What percentage of your stored homeopathic and conventional remedies are in use?

Percentage of used homeopathic remedies: ____ %
Percentage of used conventional remedies: ____ %

Anticipation of animal disorders: Early detection

5. Approximately how many times per year do you consult a nutritionist *?
Note: * in the meaning of an external adviser

- ☐ Never
- ☐ Once a year
- ☐ Twice a year
- ☐ 4 times a year (quarterly)
- ☐ 12 times a year (monthly)

6. You have the milk recordings in your hands. What are you looking for in the first place?
Note: 1 for the first answer, 2 for the second answer etc. If farmers don't look for this option make a cross. If they say SCC, ask for the amount of somatic cells.

- __ Milk yield / course of lactation
- __ Somatic cell count in general: _____
- __ Milk components (fat, protein and urea)
- __ Fertility information
- __ Somatic cell count before drying off: _____

- ☐ No analysis of milk recordings
- ☐ No milk recordings available

_____

_____

_____

7. How many animals do you look for in detail in the last milk recording?

- ☐ No use of individual data
- ☐ Use of individual data

8. In which way and how long do you spend observing your animals each day for health/welfare monitoring?

Note: only visual observation (while doing nothing else). Multiple options are possible.

- ☐ No visual observation
- ☐ 0 - 10min
- ☐ 11 - 20min
- ☐ 21 - 30min
- ☐ 31 - 40min
- ☐ > 40min

- ☐ Combined with milking routine
- ☐ Combined with feeding
- ☐ Combined with pasture/grazing

9. Do you use monitoring measurements?

Note: If they say "Yes", ask for which measurements they use? More than one answer is possible

- ☐ No monitoring measurements
- ☐ Body condition scoring (e.g. with girth of chest, measurement of backfat thickness etc.)
- ☐ California Mastitis Test
- ☐ Halters for rumination activity
- ☐ Activity detection (Pedometer)
- ☐ Feedback of automatic concentrate feeder
- ☐ Sensors integrated in AMS (e.g. conductivity of milk, detection of somatic cells or milk colour, milk yield per day, measurement of body weight etc.)
- ☐ Measurement of milk yield by milking system/equipment
- ☐ Other:_____

10. How much time do you reflect on the data provided by the monitoring records?

- ☐ 0 - 10min
- ☐ 11 - 20min
- ☐ 21 - 30min
- ☐ 31 - 40min
- ☐ > 40min

11. How frequently do you make a body condition scoring?

Note: Explain body condition scoring. If they say "No", then go to question No. 13

- ☐ No body condition scoring

	Only selected animals	All animals
post partum (first 6 weeks)		
ante partum (end of drying off)		

12. Do you document your body condition scoring regularly?

- ☐ Yes
- ☐ No

13. How many times do you trim claws per year?

Note: More than one answer is possible. If they say "No", then go to question No. 15

- ☐ No cutting of the claws / slaughter
- ☐ Individual animals (lame cows)
- ☐ Once a year (all livestock animals)
- ☐ Twice a year (all livestock animals)
- ☐ More than twice a year (all livestock animals)

14. Do you document the results of trimming of the claws?

- ☐ Yes
- ☐ No

15. Do you use means for detection of oestrus/heat?

Note: If farmers say "Yes", ask for which kinds of detection means and how many animals get detection means. More than 1 answer is possible.

	Only selected animals	All animals
Visual oestral observation		
Activity detection		
Mount detection		
Milk progesterone test		
Oestral / heat calendar		
Index card system		
Breeding bull		

- ☐ No use of detection means

16. Does a vaginal observation take place in the 6 weeks period after calving?

Note: If farmers say "Yes", ask for which degree/kind of vaginal observation and how many animals get a vaginal observation.

	Only selected animals	All p.p. animals
Visual observation of labia and discharge (external visible)		
Vaginal observation of mucosa and discharge		
Vaginal observation by veterinarian		

- ☐ No vaginal observation

17. Do you use antibiotic drying off udder injectors?

Note: If "Yes" ask for: in how many cases. If "Only selected animals": ask for the reason of selection. Multiple options are possible.

	No use	Only selected animals	All drying off animals
Antibiotic drying off udder injectors			

Reasons for selection:

- ☐ High SCC
- ☐ Positive bacteriological result of milk analysis
- ☐ Change of milk
- ☐ Frequently mastitis of individual animals (prevention)
- ☐ Other: _____

Diagnosis in the case of suspicion of diseases

18. Do you make use of measure the body temperature of animals?

Note: If farmers say "Yes", ask for in which cases / diseases and how many animals were measured.

	Only selected animals	All diseased animals
Mastitis		
Metritis		
Metabolic disorders		
Lameness		
After calving		
Others: _____		

☐ No use of measure the body temperature

19. Do you take foremilk samples before milking?

Note: If farmers say "Yes", ask for number of animals which were tested.

	Only selected animals	All lactating animals
Foremilk samples		

☐ No taking of foremilk samples

20. In the case of subclinical or clinical mastitis: Do you thoroughly palpate the udder (e.g. to identify localized induration / nodules etc.)?

Note: If farmers say "Yes", ask for in which and in how many cases

Subclinical mastitis = mammary inflammation in the absence of any clinically detecTable changes; only detecTable by changes in the milk, which need specific tests for detection: increasing SCC

Clinical mastitis = mammary inflammation accompanied by clinically detecTable changes in the mammary parenchyma or in milk; these may be accompanied by systemic clinical signs (e.g. flocks, fever, discoloration of milk)

	Only selected animals	All suspicious animals
Subclinical mastitis		
Clinical mastitis		
Others: _____		

☐ No palpation of the udder in case of mastitis
☐ Every cow during milking routine

21. Do you perform a California mastitis test (CMT)?

Note: If farmers say "Yes", ask for in which cases and how many get a CMT.

	Only selected animals	All lactating animals
Before drying off		
After mastitis therapy		
Suspected animals		
Others: _____		

☐ No use of CMT

22. Do you take quarter milk samples for laboratory (cytobacteriological) analysis before you treat a mastitis?

Note: If farmers say "Yes", ask for in which and in how many cases. Definitions of subclinical and clinical mastitis see Q20

	Only selected animals	All treated animals
Subclinical mastitis		
Clinical mastitis		
Others: _____		

☐ No taking of milk samples before treating

Success control

23. Do you control the success of the treatment in the case of ...?

Note: Ask disease by disease. If farmers say "Yes", ask for in which and how often they do a success control

	Only in single cases	All treated animals
Mastitis		
Metritis		
Metabolic disorders		
Lameness		
Others: _____		

☐ No success control after treatment

24. Do you consult a Vet to control the success of the treatment in the case of …?

Note: Ask disease by disease. If farmers say "Yes", ask for in which and how often they consult a vet at this cases

	Only in single cases	All treated animals
Mastitis		
Metritis		
Metabolic disorders		
Lameness		
Others: _____		

☐ No success control by a veterinarian

25. How were these success controls of treatments performed in the case of …?

Note: Ask disease by disease. More than 1 answer is possible

	Pure observation (visual)	Clinical investigation (e.g. CMT, hoofstand etc.)	Laboratory investigation
Mastitis			
Metritis			
Metabolic disorders			
Lameness			
Others: _____			

Attitudes towards homeopathic and conventional remedies/treatments

Note: Farmers need to indicate how strongly they agree or disagree with each statement.

26. "The use of homeopathics in dairy herds leads to reduce antibiotic resistance in dairy cows."

☐Agree strongly ☐Agree ☐Neither agree nor disagree ☐Disagree ☐Disagree strongly

27. "It will be difficult to reduce the use of conventional remedies in dairy herds in the future."

☐Agree strongly ☐Agree ☐Neither agree nor disagree ☐Disagree ☐Disagree strongly

28. "The discarding of milk due to antibiotic use is an important reason to make use of homeopathy."

☐Agree strongly ☐Agree ☐Neither agree nor disagree ☐Disagree ☐Disagree strongly

29. "The use of conventional remedies in dairy herds leads to antibiotic resistance in dairy cows."

☐Agree strongly ☐Agree ☐Neither agree nor disagree ☐Disagree ☐Disagree strongly

30. "I have the skills and knowledge needed to reduce the use of conventional remedies in dairy herds in the future."

☐Agree strongly ☐Agree ☐Neither agree nor disagree ☐Disagree ☐Disagree strongly

31. "I always prefer to use homeopathic remedies in the first place."

☐Agree strongly ☐Agree ☐Neither agree nor disagree ☐Disagree ☐Disagree strongly

32. "Homeopathic remedies work better in treating mastitis than the use of antibiotics."
☐Agree strongly ☐Agree ☐Neither agree nor disagree ☐Disagree ☐Disagree strongly

33. "The use of conventional remedies in dairy herds is a major cause of antibiotic resistance in the human population."
☐Agree strongly ☐Agree ☐Neither agree nor disagree ☐Disagree ☐Disagree strongly

34. "My intention is to increase the use of homeopathics in my dairy herd in the future."
☐Agree strongly ☐Agree ☐Neither agree nor disagree ☐Disagree ☐Disagree strongly

35. "I only use conventional remedies as a last resort (when all homeopathic treatments have failed)."
☐Agree strongly ☐Agree ☐Neither agree nor disagree ☐Disagree ☐Disagree strongly

36. "I always consult my vet before using homeopathics to treat my animals."
☐Agree strongly ☐Agree ☐Neither agree nor disagree ☐Disagree ☐Disagree strongly

37. "Homeopathy changed my mind in the way of observation of the animals."
☐Agree strongly ☐Agree ☐Neither agree nor disagree ☐Disagree ☐Disagree strongly

38. "It will be difficult to increase the use of homeopathics in my dairy herd in the future."
☐Agree strongly ☐Agree ☐Neither agree nor disagree ☐Disagree ☐Disagree strongly

39. "I always prefer to use conventional remedies in the first place."
☐Agree strongly ☐Agree ☐Neither agree nor disagree ☐Disagree ☐Disagree strongly

40. "I have the appropriate skills and knowledge to increase the use of homeopathics in my dairy herd in the future."
☐Agree strongly ☐Agree ☐Neither agree nor disagree ☐Disagree ☐Disagree strongly

41. "I think homeopathic remedies are a useful addition to conventional treatments."
☐Agree strongly ☐Agree ☐Neither agree nor disagree ☐Disagree ☐Disagree strongly

42. "Homeopathic remedies are more cost effective than conventional treatments."
Note: A combination of cost and effect/effectiveness.
☐Agree strongly ☐Agree ☐Neither agree nor disagree ☐Disagree ☐Disagree strongly

43. "I always consult my vet before using conventional remedies to treat my animals."
☐Agree strongly ☐Agree ☐Neither agree nor disagree ☐Disagree ☐Disagree strongly

44. "Conventional remedies work better in treating mastitis than the use of homeopathics."
☐Agree strongly ☐Agree ☐Neither agree nor disagree ☐Disagree ☐Disagree strongly

45. "I think homeopathic remedies work/is effective."
Note: The vet could be disappointed by efficacy of homeopathics.
☐Agree strongly ☐Agree ☐Neither agree nor disagree ☐Disagree ☐Disagree strongly

_____

_____

_____

46. How important or unimportant is it to you for the following things to happen over the next year? Please indicate, on a scale very important to very unimportant

	Very important	Important	Neither important or unimportant	Un-important	Very unimportant
1. Increasing total saleable milk production from the herd					
2. Increasing welfare and health of my animals					
3. Decreasing antibiotic resistance in my animals					
4. Consideration of the wishes of consumers					

47. What sources of information and advice do you use to find out about homeopathic remedies and their use?

Note: More than one answer is possible.

Veterinarian		Pharmaceutical rep. or advertisements	
Dairy cooperatives		Discussion forums on internet	
National institutes for animal health		Other farmers	
Family		Nutritionist/farm advisor	
Courses / Seminars		Assurance schemes / Certifications	
Farming press (e.g. magazines, newspapers)		University rep. or scientific publications	
Animal health company representatives		Books	
Web sites for farmers		Others:	

13.3 Annex III - Questionnaire on the use of homeopathy by farmers and by veterinarians

Education and expertise

1. How long have you been using homeopathic remedies?

- ☐ < 1 year
- ☐ More than 1 year
- ☐ More than 5 years
- ☐ More than 10 years

2. What training do you have in the field of homeopathy?

Note: Basic training/education. Colleagues without profound homeopathic knowledge ≠ education

- ☐ No specific education / Just doing- > go to Q6
- ☐ Self-made (e.g. with books, internet etc.)
- ☐ Online training course
- ☐ Part time (i.e. evening or weekends): totalling 1-2 days
- ☐ Part time: totalling > 2 days
- ☐ Full time: 1 day - 1 week
- ☐ Full time: 1 week - 1 month
- ☐ Full time: > 1 month

3. How many further training courses have you attended in the last 3 years?

Note: Training courses after basic education. If they say "none", please go to question No. 6

- ☐ None in last 3 years
- ☐ 1 course
- ☐ 2-3 courses
- ☐ 4-5 courses
- ☐ More than 5 courses

4. In which kind of further training courses do you get some knowledge about homeopathy?

Note: This question depends on question No. 3. More than 1 answer is possible.

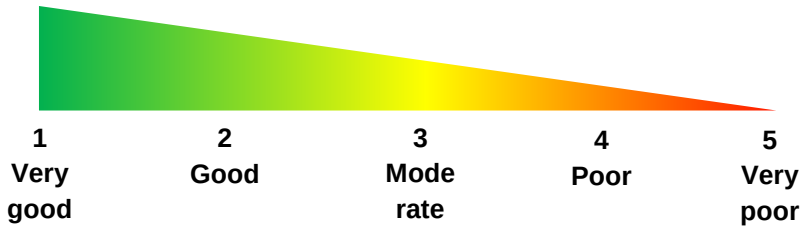
- ☐ Self-made (e.g. with books, internet etc.)
- ☐ Online training course
- ☐ Part time (i.e. evening or weekends): totalling 1-2 days
- ☐ Part time: totalling > 2 days
- ☐ Full time: 1 day - 1 week
- ☐ Full time: 1 week - 1 month
- ☐ Full time: > 1 month

5. Who mostly performed these trainings?

Note: More than 1 answer is possible.

- ☐ Professor of a university
- ☐ Veterinarian
- ☐ Other Homeopath / “Tierheilpraktiker”
- ☐ Members of a homeopathic organisation
- ☐ Professional consultant / Advisors
- ☐ Other: _____

Ranking whole part of education / expertise:



Notes:

_____

_____

Anamnesis

6. From where do you obtain the pre-information (historical health records) about the diseased animal?

Note: More than 1 answer is possible.

- ☐ No information exists (new cattle or no documentation exists)
- ☐ From memory
- ☐ From health ledger papers / cow files (e.g. Paper files or Excel etc.)
- ☐ From herd management software (e.g. Herde, Dairy Comp, Farmoffice etc.)

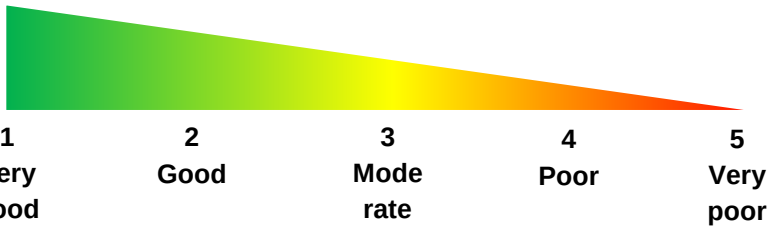
7. How do you perform a comprehensive anamnesis?

Keywords: History of diseases, procedure, Symptoms they look for, things they use, timeframe

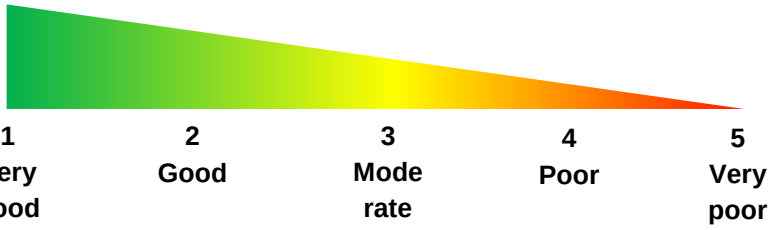
Note: If the farmer isn’t the one who do the anamnesis, please cross out this question and go to question No. 8

_____

_____



Ranking whole part of anamnesis:



Notes:

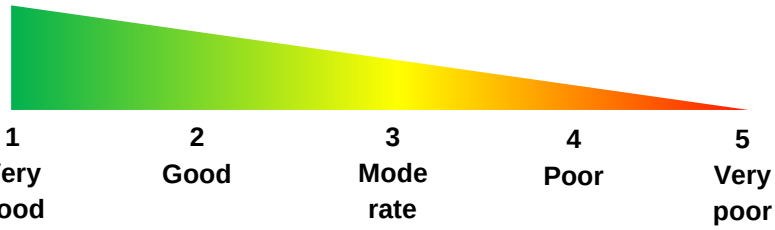
_____

_____

Diagnosis

8. How often do you seek the opinion of a professional in the diagnosis process?

- ☐ In every case of illness
- ☐ Only at specific diseases: _____
- ☐ Only if no recovery is foreseeable
- ☐ Only at selected animals
- ☐ Never



Notes:

_____

_____

Selection of remedies

9. How do you choose a remedy to treat a difficult or chronic case of disease? Please give a short description.

Note: This question deals with the practical implementation of theory.

- ☐ Level 1 - No knowledge: use of complex remedies or “Schüssler Salze”
- ☐ Level 2 - Basic knowledge: approved indications
- ☐ Level 3 - Advanced knowledge: in addition anamnesis; individual assessment of single animals: - Repertory
  - Acknowledgement of remedies (Materia medica)
  - Homeopathic remedy picture
- ☐ Level 4 - Expert: in addition compiling a hierarchy of symptoms; symptoms according to § 153 of Organon
- ☐ Level 5 - Top level: in addition Miasm or core of a remedy

How long, on average, does the full process (anamnesis, diagnosis, selection of a remedy etc.) take? ____ minutes

Notes:

_____

_____

10. Which reference materials/tools do you use for selecting homeopathic remedies?

Note: More than 1 answer is possible.

- ☐ Rely on current knowledge alone
- ☐ Internet (e.g. Google, Wikipedia etc.)
- ☐ Short manual for homeopathy
- ☐ Repertory (e.g. Kent, Synthesis etc.)
- ☐ Materia medica
- ☐ Software (e.g. Radar opus etc.)
- ☐ Advises of a vet, given by phone or by mail
- ☐ Other: _____

1 Very good **2 Good** **3 Mode rate** **4 Poor** **5 Very poor**

Ranking whole part of Selection of remedies:

1 Very good **2 Good** **3 Mode rate** **4 Poor** **5 Very poor**

Notes:

_____

_____

Availability of remedies

11. There are different sources to receive homeopathic remedies. Where do you get your homeopathic remedies?

Note: Next step: Ask for the percentage of the remedy source!

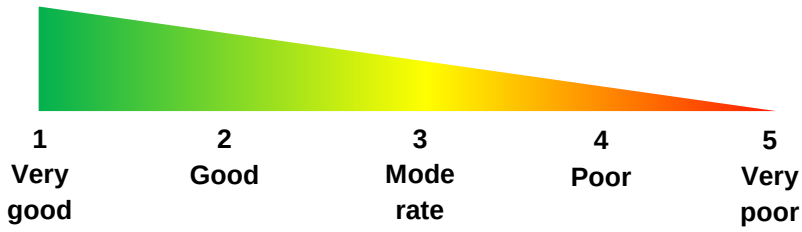
- ☐ Veterinarian: ___ %
- ☐ Pharmacy: ___ %
- ☐ Internet: ___ %
- ☐ Other:_____ ___ %

12. How long does it take in average until the appropriate conventional or homeopathic remedy is available (from vet or pharmacy)? (Apart from that remedies in your storage)

Note: All remedies apart from these remedies in your storage. Remedies from vet, pharmacy or internet. "Weekend" must be taken into account.

	Immediately	1 day	2-3 days	1 week	>1 week
Conventional remedies					
Homeopathic remedies					

Ranking whole part of Availability of remedies:



Notes:

_____

_____

Use of remedies

13. What percentage of homeopathic complex remedies and single remedies do you use in the case of …?

Note: Ask disease by disease.

	% complex remedies (clinical homeopathy)	% single/pure remedies (classic homeopathy)
Mastitis		

Metritis		
Metabolic disorders		
Lameness		
Increasing general condition		
After calving		
Other:_____		

14. Do you combine homeopathic remedies with other treatment procedures (herbal remedies, conventional medicine, acupuncture etc.)?

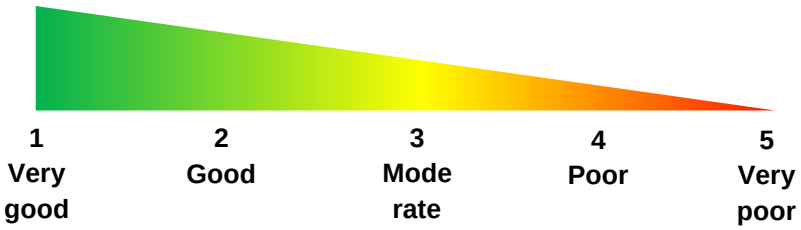
Note: If the farmer says "No", please go to question No. 15

Combination: ☐ Yes ☐ No

If Yes, in which cases do you combine homeopathy and other treatment procedures?

Note: Please note the combination method behind the disease.

☐ Mastitis: _____
☐ Metritis: _____
☐ Metabolic disorders: _____
☐ Lameness: _____
☐ Others: _____



Notes:

_____

_____

15. Do you treat diseased calves with homeopathy?

Note: If the farmer says "Yes", in which cases?

☐ No treatment of calves

	Only homeopathic remedies	Support conventional treatment by homeopathic remedies
Diarrhoea		
Bronchopneumonia/pneumonia		
Navel inflammation		
Weak calves (increasing general condition)		
Others:_____		

16. Do you use homeopathic remedies prophylactically to prevent mastitis?

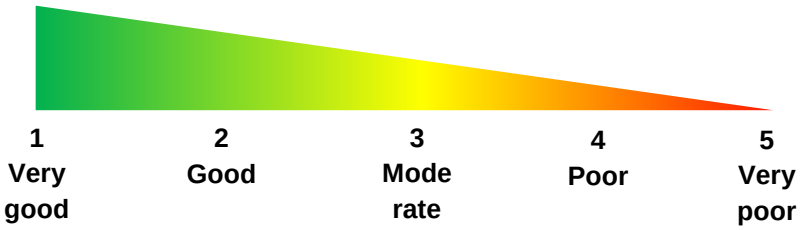
Note: Only in the case of drying off. If "Yes" ask for: in how many cases. If "Only selected animals": ask for the reason of selection.

	No use	Only selected animals	All animals
Homeopathic remedies			

Reasons for selection:

☐ High SCC
☐ Positive bacteriological result of milk analysis
☐ Change of milk
☐ Frequently mastitis of individual animals (prevention)
☐ Other: _____

Ranking whole part of use of remedies:



Notes:

_____

_____

Specific cases of treatment

17. Homeopathy: What is the severity level when you consult a professional in the case of …?

Note: Ask disease by disease. Note the symptoms of severity level. If the farmer consults a professional, ask for the type of professional. * We will know from other questionnaire if the vet use homeopathy or not

☐ No consultation in all cases of diseases

Mastitis:

_____

_____

	Local Vet *	Another vet who uses homeopathy	Other homeopaths	No consultation
Consultation of				

Conventional treatment: Same severity level for consultation of a professional?

☐ Yes

☐

No:_____

_____

Metritis:

_____

_____

	Local Vet *	Another vet who uses homeopathy	Other homeopaths	No consultation
Consultation of				

Conventional treatment: Same severity level for consultation of a professional?

☐ Yes

☐

No:_____

_____

Metabolic disorders:

_____

_____

	Local Vet *	Another vet who uses homeopathy	Other homeopaths	No consultation
Consultation of				

Conventional treatment: Same severity level for consultation of a professional?

☐ Yes

☐

No:_____

_____

Lameness:

_____

_____

	Local Vet *	Another vet who uses homeopathy	Other homeopaths	No consultation
Consultation of				

Conventional treatment: Same severity level for consultation of a professional?

☐ Yes

☐

No:_____

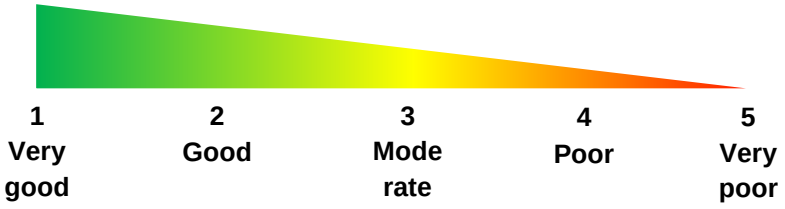
_____

18. In the case of … when do you use homeopathy or conventional treatments?

Note: Ask disease by disease. Note the symptoms of diseases which were treated by homeopathic or conventional treatments.

	Homeopathy	Conventional treatment
Mastitis:		
_____	☐	☐
_____	☐	☐
_____	☐	☐
_____	☐	☐
Metritis:		
_____	☐	☐
_____	☐	☐
_____	☐	☐
_____	☐	☐
Metabolic disorders:		
_____	☐	☐
_____	☐	☐
_____	☐	☐
_____	☐	☐
Lameness:		
_____	☐	☐
_____	☐	☐
_____	☐	☐
_____	☐	☐

Ranking whole part of Specific cases of treatment:



Notes:

_____

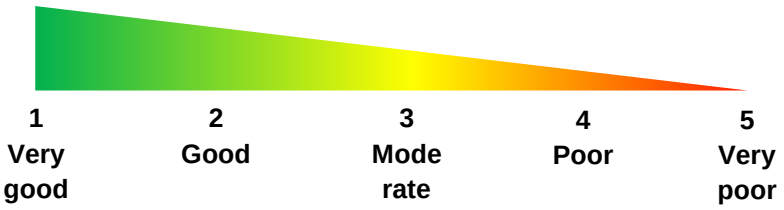
_____

Control of success

19. The homeopathic treatment did not work. What do you do next? Please give a short description of your further procedure.

_____

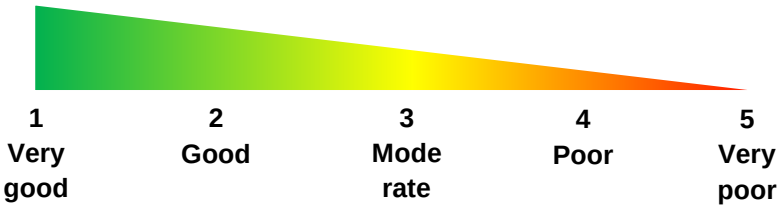
_____



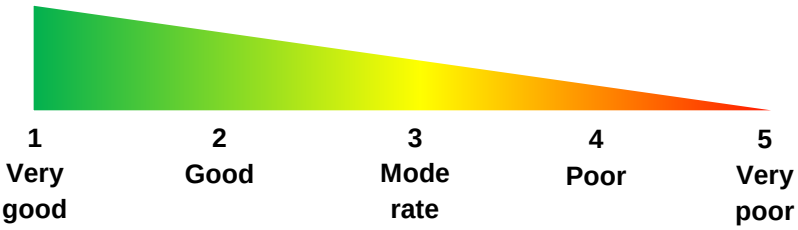
20. The conventional treatment did not work. What do you do next? Please give a short description of your further procedure.

_____

_____



Ranking whole part of Success control:



Notes:

_____

_____

Documentation in the use of conventional and homeopathic remedies

21. In the case of homeopathic treatment, which kind of anamnesis information do you record?

Note: More than one answer is possible. Afterwards ask the farmer if they also document all these information for conventional treatment → if "No", ask for the differences.

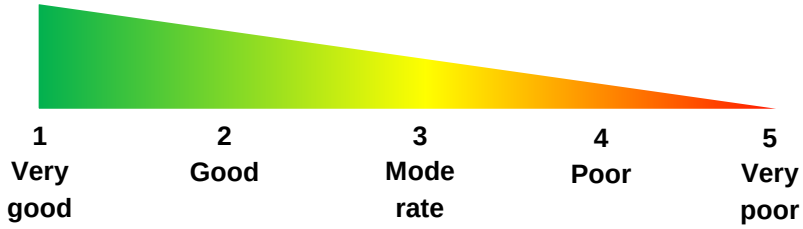
Homeopathic treatment	Conventional treatment: ☐ Same as Homeopathy
☐ General Condition (e.g. fever, appetite etc.):	☐ General Condition (e.g. fever, appetite etc.):
☐ Milk results:	☐ Milk results:
☐ Character	☐ Character
☐ Udder:	☐ Udder:
☐ Causa:	☐ Causa:
☐ Striking symptoms	☐ Striking symptoms
☐ Modalities	☐ Modalities
☐ Rectal findings	☐ Rectal findings
☐ Vaginal findings	☐ Vaginal findings
☐ Calving / Pregnancy	☐ Calving / Pregnancy
☐ CNS (Symptoms for locomotion/balance)	☐ CNS (Symptoms for locomotion/balance)
☐ Rumen	☐ Rumen
☐ Behaviour problems	☐ Behaviour problems
☐ Course of heat/oestrus	☐ Course of heat/oestrus
☐ Laboratory results	☐ Laboratory results
☐ Movement problems	☐ Movement problems
☐ External sign (e.g. injuries etc.)	☐ External sign (e.g. injuries etc.)
☐ Others:	☐ Others:

22. In the case of homeopathic treatment, do you document "treatment steps"?

Note: If the farmers say "Yes", ask for what kind of steps and number of cases.

	Never (0%)	Partially (1-99%)	Every time (100%)
Diagnosis			
Treatments			
Change of remedies			
Success control			

Ranking whole part of documentation:



Notes:

_____

_____

Conclusion:

21. Does the user of homeopathy has the appropriate expertise or skills to treat the animals with homeopathic remedies?

Notes:

_____

_____

13.4 Annex IV - Questionnaire on opponents of homeopathy

1. Are you a sole trader or do you work in a large practice?

- ☐ Sole trader
- ☐ Large practice

2. How long do you have been practicing?

- ☐ < 5 years
- ☐ 5-10 years
- ☐ 11-15 years
- ☐ 16-20 years
- ☐ 21-25 years
- ☐ > 25 years

3. Have you ever received any training in homeopathy?

Note: If "yes", ask what kind of training. If they say "no", go to Q4. These expenditures of time are global totals (not totals per year, week etc.) Types of training = Multiple options are possible.

- ☐ No
- ☐ Yes → Types of training:
  - ☐ No specific education / Just doing
  - ☐ Self-education (e.g. with books, internet etc.)
  - ☐ Online training course
  - ☐ Part time (i.e. evening or weekends): totalling 1-2 days
  - ☐ Part time: totalling > 2 days
  - ☐ Full time: 1 day - 1 week
  - ☐ Full time: 1 week - 1 month
  - ☐ Full time: > 1 month

4. Would you be interested to receive some training?

Note: If "No", ask for the reason why not. Reasons = Multiple options are possible.

- ☐ Yes
- ☐ Perhaps
- ☐ No → Reasons:
  - ☐ No time
  - ☐ No appropriate training courses/materials available
  - ☐ Too expensive
  - ☐ No demand from farmers
  - ☐ Don't believe in homeopathy
  - ☐ Other: _____

5. Have you ever, even without training, prescribed homeopathic treatments to your farmers in the past?

Note: If "yes", ask which animals they have treated, the types of illness and which kind of remedies did they use. If "no", ask why not. More than 1 answer is possible.

☐ No → Reasons:
- ☐ Don't believe in homeopathy
- ☐ Absence of knowledge
- ☐ No demand from farmers
- ☐ Other: _____

☐ Yes → Treated animals:
- ☐ Cows
- ☐ Calves
- ☐ Both

→ Types of illness:
- ☐ Mastitis
- ☐ Metritis
- ☐ Metabolic disorders
- ☐ Lameness
- ☐ Diarrhoea (Calves)
- ☐ Pneumonia (Calves)
- ☐ Other: _____

→ Remedies used:
- ☐ Complex remedies
- ☐ Pure/Single remedies

6. How likely is it that you will prescribe a homeopathic remedy for your clients in the next 12 months?

- ☐ Definitely
- ☐ Quite likely
- ☐ Uncertain
- ☐ Not likely
- ☐ Definitely not

7a. How likely is it that the following factors will be of any relevance in your decision to prescribe homeopathic remedies (please rank, where 1=highly likely and 7=highly unlikely)?

	1	2	3	4	5	6	7
Negative attitudes of my clients/friends/ neighbours							
Lack of availability of remedies							
Negative attitudes of those why buy from my clients (consumers etc.)							
Lack of training courses for myself or clients							
Absence of skills and knowledge of vet/adviser							
Clients don't have necessary skills							
Treatment takes too much time							
Treatment is too expensive							
Insufficient access to herds to monitor novel treatments							
Other:_____							

7b. How important are the following factors in your decisions to prescribe homeopathic remedies? (please rank, where 1=highly likely and 7=highly unlikely)

	1	2	3	4	5	6	7
Attitudes of my clients friends/neighbours							
Attitudes of my colleagues / superiors							
Attitudes of those why buy from my clients (consumers)							
Availability of remedies							
Availability of training courses for myself or clients							
Skills and knowledge of clients							
Skills and knowledge of vets							
Amount of time that treatment takes							
Cost of homeopathic treatment							
Level of access to herds to monitor novel treatments							

8. What are your needs to increase the likelihood to use homeopathic remedies in future?

- ☐ A basic education/training course
- ☐ Support from a colleague / superiors
- ☐ More clients who would like to treat their animals with homeopathy
- ☐ More time for a comprehensive anamnesis / diagnosis
- ☐ Scientific evidence of efficacy of homeopathic treatments
- ☐ Other: _____

9. In your opinion, do you think that your clients would like to use more homeopathic remedies?

Note: If "no": ask for the most frequently mentioned constraints given by your clients. Multiple options are possible.

☐ Yes
☐ Perhaps
☐ No → Constraints:
- ☐ Farmers don't believe in homeopathy
- ☐ Absence of knowledge
- ☐ No time for animal observation/anamnesis
- ☐ Farmers believe without conventional treatment the animal health will decrease
- ☐ Homeopathic remedies are too expensive
- ☐ Prejudices of other farmers colleagues/superiors
- ☐ Other: _____

10. Do you have farmers among your clients that make use of homeopathy by themselves?

Note: If "yes": ask for types of farms and how the vets deal with these farms. Multiple options are possible.

☐ No
☐ Perhaps
☐ Yes → Kind of farms:
- ☐ Conventional farms
- ☐ Organic farms
- ☐ Both

→ Handling:
- ☐ We don't discuss it
- ☐ We discuss the use of homeopathy, but I (vet) don't offer comments or make changes to other treatments
- ☐ We discuss it and I (vet) adapt treatments to accommodate it
- ☐ Recommendation against using homeopathy
- ☐ I specify limits to the areas of use of homeopathic remedies
- ☐ Other: _____

11. Are your clients asking you to prescribe more homeopathic remedies than they did in the past?

Note: If "Yes", ask for the reasons/main issues why farmers would like to use more homeopathy. A ranking is needed: 1 for the first answer, 2 for the second answer etc. If vets don't look for this option make a cross.

☐ No
☐ Yes → Reasons:
- __ To reduce the use of antibiotics
- __ Improving the animals health
- __ Homeopathics are cheaper
- __ Reducing the amount of discarded milk
- __ Other: _____

12. Do you think there is a need for more homeopathic compounds or complex remedies dedicated to particular health issues (e.g. calving difficulties, mild mastitis etc.) to simplify the prescription?

Note: If "yes": ask for the types of cases.

☐ No
☐ Perhaps
☐ Yes → Cases of illness: _____

13. Would you think it relevant to have an "introductory course" to homeopathic medicine for all vets in training at the vet school?

☐ No
☐ Perhaps
☐ Yes

14. Do you think homeopathy could be an option to help reducing the use of antibiotics?

☐ No
☐ Perhaps
☐ Yes

15. To what extent do you think the following sources of information and support would approve of you prescribing homeopathic remedies for your clients?

Note: rank on a scale of 1 (greatly approve) to 7 (greatly disapprove)

	1	2	3	4	5	6	7
Other vets							
My professional association							
My friends and family							
Farming press							
Animal health company representatives							
Colleges/Veterinary training course operators							
Agriculture ministry							
Milk buyers							
Nutritionists/farm advisers							
Certification/assurance schemes							

16. How important is it for you to have the approval of the following sources of support and advice?

Note: rank on a scale of 1 (very important) to 7 (not important at all)

	1	2	3	4	5	6	7
Other vets							
My professional association							
My friends and family							
Farming press							
Animal health company representatives							
Colleges/Veterinary training course operators							
Agriculture ministry							
Milk buyers							
Nutritionists/farm advisers							
Certification/assurance schemes							

17. Do other colleagues use homeopathic remedies in the practice?

Note: If the vet is a sole trader go to question No. 18

☐ Yes
☐ No

18. How close is your relationship with your clients and does this affect the likelihood of your prescribing homeopathic remedies?

Likelihood for prescribing homeopathic remedies	Very close	Close	Neutral	Not very close
↑ **Increasing**				
←→ **No influence**				
↓ **Decreasing**				

Attitudes towards homeopathic treatment

Note: Vets need to indicate how strongly they agree or disagree with each statement

19. "I think homeopathy works."
☐Agree strongly ☐Agree ☐Neither agree nor disagree ☐Disagree ☐Disagree strongly

20. "I think the efficacy of homeopathy is scientifically validated."
☐Agree strongly ☐Agree ☐Neither agree nor disagree ☐Disagree ☐Disagree strongly

21. "I always prefer to use conventional remedies in the first place."
☐Agree strongly ☐Agree ☐Neither agree nor disagree ☐Disagree ☐Disagree strongly

22. "I think homeopathic remedies are a useful addition to conventional treatments."
☐Agree strongly ☐Agree ☐Neither agree nor disagree ☐Disagree ☐Disagree strongly

23. "After homeopathic treatment of mastitis I think a good outcome would result."
☐Agree strongly ☐Agree ☐Neither agree nor disagree ☐Disagree ☐Disagree strongly

24. "I only would use homeopathy as a last resort when conventional treatments have failed."
☐Agree strongly ☐Agree ☐Neither agree nor disagree ☐Disagree ☐Disagree strongly

25. "I always prefer to use homeopathic remedies in the first place."
☐Agree strongly ☐Agree ☐Neither agree nor disagree ☐Disagree ☐Disagree strongly

26. "I am very concerned about the risk of antibiotic resistance in livestock."
☐Agree strongly ☐Agree ☐Neither agree nor disagree ☐Disagree ☐Disagree strongly

27. "Homeopathic remedies are more cost effective than conventional treatments."
Note: A combination of cost and effect/effectiveness.
☐Agree strongly ☐Agree ☐Neither agree nor disagree ☐Disagree ☐Disagree strongly

28. "I am concerned that prescribing ineffective homeopathic treatments will damage my professional reputation."
☐Agree strongly ☐Agree ☐Neither agree nor disagree ☐Disagree ☐Disagree strongly

13.5 Annex V – List of OA, SN and PBC questions identified for use in the TPB analysis

Outcome attitude (OA) statements (& question number)		Perceived Behavioural Control (PBC) questions/statements		Subjective Norm (SN) peer groups (& question number)	
Q7a_7	Treatment takes too much time	Q7_2	Lack of availability of remedies	Q15_1	Other vets
Q7a_8	Treatment is too expensive	Q7_4	Lack of training courses for myself or clients	Q15_2	My professional association
Q14	Do you think homeopathy could be used to reduce use of antibiotics?	Q7_5	Absence of skills and knowledge of vet/advisor	Q15_3	My friends and family
Q19	I think homeopathy works	Q7_6	Clients don't have necessary skills	Q15_4	Farming press
Q23	After homeopathic treatment of mastitis I think a good outcome would result			Q15_5	Animal health company representatives
Q28	I am concerned that prescribing ineffective homeopathic treatments would damage my professional reputation			Q15_6	Colleges/veterinary training course operators
				Q15_7	Agriculture ministry
				Q15_8	Milk buyers
				Q15_9	Nutritionists/farm advisors
				Q15_10	Certification/assurance schemes
				Q9_1	In your opinion would your clients like to use more homeopathic remedies?