



How can veterinarians be interesting partners for organic dairy farmers? French farmers' point of views



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ABSTRACT

Organic dairy farmers must live up to the organic goal of 'good health' in respect the organic principles and regulation. Veterinarians could be the organic dairy farmers' expected sparring partners in reaching this goal but have found difficulties to establish advisory relationships with them. The objectives of this study are –from organic dairy farmers' points of view- (i) to describe farmers' objectives and strategies regarding herd health, (ii) to describe private veterinarians' roles in farmers' animal health promotion strategies and (iii) to identify farmers' reasons for accepting veterinarians in an advisory role. Fourteen organic dairy farmers were interviewed using qualitative research interviews. Data collection and analysis was performed using a modified approach to Grounded Theory. Organic dairy farmers had animal health management strategies focusing on animal health promotion. Veterinarians had most often solely the role of therapist in farmers' animal health management strategies. Reasons explaining that veterinarians were not able to establish advisory roles were found in the differences between veterinarians and farmers regarding their animal health strategies and solutions to disease problems. Furthermore, veterinarians did not always share farmers' (organic) objectives, values and priorities and this could lead to disagreement on the best choice in animal health management practices. This might be further amplified in situations where there exists a lack of dialogue and mutual interest in other.

1. Introduction

Health is one of the key tenets of organic farming. Public health, animal health or environmental health is defined by the International Federation of Organic Agriculture Movements (IFOAM) as: 'the wholeness and integrity of living systems. It is not simply the absence of illness, but the maintenance of physical, mental, social and ecological well-being. Immunity, resilience and regeneration are key characteristics of health. Organic agriculture should 'sustain and enhance the health of soil, plant, animal, human and planet as one and indivisible.

Farmers constantly need to develop the herd and the farm to live up to this goal of 'health', and respond to all challenges while respecting the organic principles and standards. In organic agriculture, animal health promotion strategies go beyond targeting specific disease conditions and aim at reaching a state of homeostasis (Vaarst and Alroe, 2012). In conformity to the Council Regulation (EC) No 834/2007 on organic production, animal health should be promoted mainly through the use of appropriate housing conditions, feeding practices and choice of breeds. The use of conventional veterinary medicine is restricted and the use of alternative medicines is promoted (Council Regulation (EC)

834/2007). Animal health promotion strategies on organic farms are based on long-term and strategic farming decisions promoting a good balance between the animal and its environment, preventing situations of imbalance causing injury or disease. In addition, tactical disease prevention strategies targeting a specific disease based on goal-focused efforts are used (Hovi et al., 2004). LeBlanc et al. (2006) supported this view, affirming that an advisory-oriented role in herd health management requires a holistic farm approach of advisors and farmers. However, despite the objective of enhanced animal health, applying the organic standards does not guarantee less production diseases in organic dairy herds, compared to conventional herds (Barkema et al., 2015).

Private veterinary practitioners (further referred to as veterinarians) can be expected to be the most relevant partners of dairy farmers in developing their herd health promotion strategies. The roles of veterinarians have generally shifted towards being more management related, acting at herd level, advising on disease prevention and even health promoting strategies, where it previously was more about treating individual ill animals (LeBlanc et al., 2006; Ruston et al., 2016). Moreover, veterinarians are considered by some farmers as

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referents on specific topics such as biosecurity or vaccination (Gunn et al., 2008; Richens et al., 2015). However, veterinarians can find it difficult to establish a close collaboration with farmers on herd health and production promotion in general (Duval et al., 2016a; Ruston et al., 2016). Such a collaboration requires amongst other regular farm visits, awareness of farmers' goals, data analysis and a certain level of trust to ultimately obtain an advisory role in farmers' herd health promotion and production strategies (e.g. Green et al., 2012; Mee, 2007). For example, some sheep farmers expressed to be reluctant to work with a veterinarian on herd health management because they did not always trust in veterinarians' knowledge in sheep farming, and the poor economic situation of the sector did not always allow to afford such services (Kaler and Green, 2013). Moreover, dairy farmers and veterinarians did not always have the same expectations of what the role of the veterinarian should be (Hall and Wapenaar, 2012) and veterinarians were not always aware of farmers' goals (Derks et al., 2013).

On organic dairy farms in particular veterinarians seem to struggle to acquire an advisory role. In certain cases even veterinarians that did provide herd health advisory services to dairy farmers in general, have found it difficult to do so on organic dairy farms. Even in situations in which they observed that the animal health situation could benefit from their advice (Duval et al., 2016a). Also, French organic meat sheep farmers did not turn as often to their veterinarians compared to the conventional farmers in case of animal health issues (Cabaret et al., 2011). In Denmark too, veterinarians were mainly involved in disease treatments or diagnostic procedures, such as bacteriological culturing (Vaarst et al., 2003, 2006). Pieper (2014) reported that Canadian veterinarians were involved on organic dairy farms in planned and frequent advisory services in reproductive performances and possibly in herd health. However, few farmers counted on veterinarians to provide them with advice on disease prevention (Pieper, 2014).

No study had as main objective to understand the origin of the limited role of veterinarians on organic dairy farms and the organic dairy farmer-veterinarian relationship, as far as we are aware. Certain studies focusing on organic dairy farmers' animal health strategies in general provide some elements to understand the limited role of veterinarians on these farms. According to organic farmers, veterinarians were not the best qualified health management advisors, because they perceived that veterinarians lack respect for farmers' goals, most importantly being 'organic'. A perceived lack of dialogue and a feeling of inequality by farmers were also reasons not to appreciate fully the collaboration with veterinarians (Vaarst et al., 2007). The apparent focus of veterinarians on treatments rather than having an approach to solve the underlying problem could be another reason (Pieper, 2014).

The organic dairy sector in France is expected to continue to grow in the coming years, continuing the sectors' steady growth since 2006 (CNIEL, 2015). In 2015, 2432 dairy farms were certified organic in France. This number represents about 2% of the total dairy farms in France. In that year, 815 dairy farms were converting to organic production. Organic dairy cows represented 3.4% of the total French dairy cattle population. This growth is expected to be stimulated by the current economic crisis in French agriculture, which also negatively affects conventional dairy farms' financial situations (Anonymous, 2016). We can thus assume that veterinarians will work more frequently with organic dairy farmers in the near future. It is therefore important to understand why French veterinarians have a limited role in organic dairy farmers' animal health promotion strategies. And to identify if there are specific factors related to organic production that explain this situation. To our knowledge, French organic dairy farmers' experiences and views on their working relationship with their veterinarians have not yet been studied. In addition, this study allows us to compare and discuss our results with those of a recent study by Duval et al. (2016a). That study was conducted in the same geographic area and period in time, studying veterinarians' point of view on their role in organic dairy farms. So, the objectives of this paper are – from organic dairy farmers' point of view- (i) to describe farmers' objectives and

strategies regarding herd health, (ii) to describe veterinarians' roles in farmers' animal health promotion strategies and (iii) to identify farmers' reasons for accepting veterinarians in an advisory role.

2. Material and methods

2.1. Selection and recruitment of interviewees

A purposeful sample was chosen, using 4 selection criteria to recruit interviewees. More than half of the French organic dairy cattle population is located in the West of France: in the regions Pays de la Loire, Bretagne and Basse-Normandie (Agence, 2015). Therefore, the first selection criterion was to recruit organic dairy farmers in these regions. Second, farmers had to be in an area in which it was known that paid advisory services in dairy herd health were offered by veterinarians. That information was obtained from a list available to students of the veterinary school in Nantes to choose veterinary practices for their internships. Two other criteria were taken into account in the selection of interviewees, namely herd size and the number of years that the farm had been certified as organic. We hypothesized that herd size could influence the occurrence and types of disease problems, the care offered to animals (e.g. organization of work), and time spent with animals. And that the number of years certified as organic might influence the farmers' experience in the use of alternative medicine. Moreover, it might influence the herd health status, as it might require time to return to a balanced state after conversion. The length of the official conversion period is 24 months. We aimed to recruit interviewees showing a variation on these last two selection criteria.

Contact details, geographic location, the numbers of years that a farm is certified as organic and agricultural productions of the farm (only dairy or also other animal productions) were obtained from an online directory of organic farmers of the French agency for the development and promotion of organic farming (Agence BIO). That information was used to identify farmers meeting our selection criteria. Potential interviewees were then randomly contacted by telephone. After an introduction on the study, details on the farm characteristics were checked to assure the recruitment of a panel of farmers representing a variation on the selection criteria. We did not have any prior contact with these farmers or knowledge on their relationship with their veterinarian. Farmers' reasons to decline participation in the study were: a lack of time or interest. The interviewees did not receive benefits for their participation. A total of fourteen farmers were interviewed. Fourteen interviews were considered sufficient since after twelve interviews saturation was reached, meaning that no new themes emerged from the interviews.

2.2. Data collection and analysis

Qualitative semi-structured research interviews were conducted in French with all participating farmers on their own farm, using the interview guide presented in Table 1. All interviews were digitally recorded and farmers were assured anonymity. The first author conducted all interviews between July and October 2015. On average the duration of the interview was 57 minutes, and most interviews were preceded by a farm walk led by the farmer.

A qualitative research interview approach was chosen as it aims at understanding the context of the interviewees, and unfolding their experiences and perceptions in their own wordings. The objective is to know how interviewees describe their experiences or reasons for actions in the world as they experience it. Qualitative research interviews aim at showing variation rather than quantification (Brinkmann and Kvale, 2015).

The interviews were structured around different topics by the interviewer, using open questions. However, the interviewees were encouraged to speak and steer, to some extent, the course of the interview. Thus, depending on their personal experiences, particular themes were

Table 1

List of themes discussed during the interviews with organic dairy farmers to understand their working relationship with their private veterinary practitioner.

Farmers' motivation to convert the farm to organic production
Farmers' perception on animal health promotion strategies and the role of veterinarians in this; farmers' disease prevention strategy, its importance in the management of herd health
Organization of work with the veterinarian: reasons for inviting the veterinarian to the farm, topics discussed, number of different veterinarians that visit the farm
Farmers' experience of the collaboration with the veterinarian today; positive and negative aspects.
Farmers' expectations for the collaboration with the veterinarian; are the expectations being met and farmers' criteria used to judge this. Are the expectations related to being in organic dairy farming or not. Farmers' methods to make veterinarians aware of his/her expectations.
Farmers' perceptions on whether their expectations regarding the working relationship with their veterinarian are currently met.
Evolution of the role of veterinarians on the farm during the conversion process to organic; involvement of the veterinarian in the conversion, evolution of the herd health status during conversion, possible change in expectations for the veterinarian due to conversion process. Possible change in services provided by veterinarians in time.
Persons, other than the veterinarian, that have the role of advisor in animal health on the farm; and reasons why.
Sources of information that have been used to define the herd health strategy by the farmer. If wished, ways to involve the veterinarian in the strategy.

discussed more or less in depth during the different interviews. The interviewer was responsible for addressing all the interview questions and clarify, as far as possible, seemingly self-contradictory or unclear statements.

A modified approach of Grounded Theory was used for the data collection and analysis, as it allows not only to describe the phenomenon under study, but also to attempt finding explanatory factors (Charmaz, 2014). The iterative process used in Grounded Theory permitted continuous improvement of the interview guide during the data collection process, through the reformulation of questions, addition of questions and ensuring more in depth discussion of emerging topics in the next interviews.

The interviews were fully transcribed by external transcribers. All transcriptions were checked against the original recording and adapted if necessary by JD. The analysis of the interviews was focused on the meaning of what was said during the interviews. Relevant transcript passages, describing an action or an experience, were coded with keywords by JD using Transana[®] (qualitative analysis software). A data driven coding method was used; meaning that codes were developed during the readings of the data and were not defined beforehand. Across interviews; these codes were then compared and organised in different categories. This stage was followed by a meaning interpretation step; aiming to identify structures and connections between meanings that are not explicitly stated. To facilitate this organization and interpretation step; codes and relevant extracts from the transcripts were transferred to and further organised in Mindjet MindManager 14[®] (mind mapping software). This allowed visual display of the process and facilitated regular in depth discussion between JD and MV on the justness of the coding and the interpretation process. The different emergent themes that were considered central in explaining the phenomenon under study are presented in the results section.

3. Results

3.1. Organic dairy farmers' objectives and herd health strategies

3.1.1. Reasons for farmers to convert to organic

The interviewed farmers gave different reasons that stimulated their decision to convert to organic production. Main motivations to convert to organic production were: to stop the use of pesticides in order to reduce the negative impact on human health and the environment, to

reduce the use of conventional veterinary medicine, and/or the farmer's overall search for an 'improved quality of life'. Higher added value of their farm products and ensuring the economic viability of their farm was either the main motivation to change their system to organic or added on to their initial motivation(s) described above.

IF7: 'Well, I have always been sensitive to nature... And treatments, pesticides, I did not like it, I saw the damage it did to the soil (...). So there was a desire to convert to organic, but triggers were needed, so there were, ehm, personal reasons and everything, that made us want to convert to organic. (...) I remember a day I had been weeding, the day after (...) I was ill because of the pesticides. I said: "It is over, we stop spraying". There were different things that made... And I, I liked to plant trees, and to respect an ecosystem that favours meadows, the animals and everything. Today I see it, the guys here, when it is too hot, they keep their animals in the stables, because there are no trees anymore. (...) But I, when it is hot, I put my animals in the fields where there are trees. And financially, well... we are not on a family farm, so we managed to finance our farm (...) In the end, we have created our farm, we managed to live, to take holidays, and to have a profession that we like, and that is very important.'

Veterinarians and other advisors did not always agree with the objectives of organic farmers. IF9 gave the example that his veterinarian considered organic dairy farms with high production levels more successful than his farm. The farmer disagreed with the veterinarian because he related a milk production at that level to feeding imported soya, which he considered not coherent with an organic farming system. This was an example where the veterinarians' reference values for a successful dairy farm were different from farmers' values.

In most cases, the conversion to organic had not been a dramatic or abrupt change. Often, over a period of a number of years, their farming system and practices had gradually changed towards or were already close to an organic production system at the time of the formal conversion. Examples could be that they already had limited the use of pesticides or chemical medical treatments of animals, and/or they had a feeding system based on grazing on pastures, and adapted to organic farming, like expressed by IF8 below.

IF8: 'We used antibiotics and I was not satisfied. So, I said to myself, there are guys that succeed in organic. In that [group of organic farmers, Ed.], you have people that are "cool", even too relaxed, and then you have people that are more 'technical'. So, we will go and see how the 'technical' manage. So, it opened us, at the start, not to a change of practice, but to a reflexion on our farm, to the 'why' we have problems (...) instead of being always in an emergency situation and treating, asking you the 'why' question. So we have evolved like that, trying to reduce our consumption of antibiotics. And we have evolved step by step, and in 2009 during the milk crisis we asked ourselves whether our system was profitable, and at that moment we said that we would go towards a bit more autonomy. So, we started to change our reasoning, introduce alfalfa, things like that (...) and then in 2012, we have done an economical study [of the conversion of the farm to organic]. Because there, I saw what could work on the farm... we did an economical study, and we said 'go'...'.

3.1.2. General development of the herd health and disease situation since conversion

Farmers experienced the consequences of the conversion on herd health differently. Some farmers noticed improvement whereas others experienced deterioration in the beginning of the conversion, or no effect at all. The most important factor seemed, according to the farmers, to be how much the farm system had to change to become certified organic. In cases where almost nothing needed to be changed the conversion did not have an impact on herd health. For example, IF2: 'Sometimes at the start of the conversion animals have a diet that makes that there are difficult periods, they lose a lot of muscles, the animals suffer. Yes it

Table 2
 Characteristics of the organic dairy farms and organic dairy farmers' appreciation of the health status of their herd, their animal health management practices and collaboration with their private veterinary practitioner.

Farmer ID	Years certified organic	Average number lactating cows	Average milk production (kg/cow/year)	Current herd health status and disease challenges	Usage alternative medicine	Main reason veterinary intervention
IF1	4	64	8000	Some cows show a strong loss of body condition after calving	yes, occasionally	Individual disease problems
IF2	2	100	5400	No particular disease problem	yes, limited use	Individual disease problems
IF3	1	85	4500	Insufficient mastitis cure rates during dry period	yes, occasionally	Individual disease problems
IF4	6	40	4500–5500	Some mastitis problems after the dry period	yes, important	Individual disease problems
IF5	6	60	Unknown	Mastitis problems during the dry period	yes, important	Individual disease problems
IF6	6	85	7000	No particular disease problem	yes, occasionally	Individual disease problems
IF7	17	55	6000	No particular disease problem	yes, first choice	Diagnose individual disease problems
IF8	0	60	6000	No particular disease problem	yes, occasionally	Individual disease problems
IF9	15	23	4000	No particular disease problem. In the recent past, rise in herd SCC	yes, limited use	Individual disease problems
IF10	6	30	5000	No particular disease problem. In the recent past, rise in herd SCC	yes, first choice	Individual disease problems
IF11	0	75	Unknown, used in cheese production	Milk quality for the transformation of milk to cheese	yes, first choice	Individual disease problems, diagnosis disease problem
IF12	16	42	5000	No particular disease problem	yes, occasionally	Individual disease problems, hoof trimming, dehorning calves and fertility checks
IF13	13	50	5800–6000	Lameness problems, calves with coccidiosis	yes, occasionally	Individual disease problems
IF14	7	50	5000	No particular disease problem	yes, first choice	Individual disease problems

is true that on big farms that convert to organic, cows suffer. However, on our farm we did not change much our system because our production was already not that high, so it [milk production Ed.] did not drop much'. At the time of the interviews, some farmers experienced disease problems at herd level, beyond the occasional diseased individual animal (Table 2). No obvious correlation were observed between the number of years certified as organic or herd size and specific herd health problems on the farm. Nor was there a correlation with the use of alternative medicine.

3.2. Farmers' herd health strategies

Farmers generally focused on animal health promotion strategies to ensure the health of their herd. Most often feed quality played a central role in farmers' animal health promotion practices. All interviewed farmers had a feeding system in which grass (in different forms) was the main component of the cows' diet, and with relatively long grazing seasons, up to year-round. The importance of animal health promotion in the management of the herd differed between farmers and could evolve over time. Farmers sometimes had developed this approach over time from almost non-existing.

IF14: 'We used to monitor the herd, but without asking ourselves too many questions when she [a cow, Ed.] was ill, either we treated or we called the vet. But we did not go as far as to say; "Well, if she is ill, or if there are several cases like that, I must have a problem with the feed, maybe I should resolve it".'

Other elements of their animal health promotion strategies were for example the use of adapted genetic material, housing conditions, hygiene measures, surveillance and timely human care-taking. These were all measures targeting health rather than a specific disease.

3.3. The role of veterinarians on organic dairy farms

3.3.1. Veterinarians were not involved in the conversion to organic agriculture

The interviewed farmers either stated explicitly that their veterinarians were not involved in the conversion of the farm to organic or they did not mention them while discussing the conversion period, suggesting that they were not involved. Or as IF6 expressed: 'Ah, well we have not even thought of him!' The only exception was the case of IF7 where the veterinarian played an important role in supporting the farmer in the conversion of the farm, for example by advising the farmer on the adaptation of the feeding system of the cows.

3.3.2. Veterinarians mainly visit the farms to treat diseases

Veterinarians generally intervened in relation to ill animals, calving problems or acute herd health problems when farmers felt that they could not manage to resolve the problem themselves (Table 2). In general, farmers were satisfied by this service provided and appreciated veterinarians their availability to intervene quickly in emergencies and their technical competences, such as surgical skills. Moreover, farmers expressed that the need for this type of intervention by a veterinarian would always remain. Other, less frequent, reasons to ask for veterinary intervention were: to diagnose a disease problem, questions on treatment choice or other specific topics, or for tasks such as echography for pregnancy. Veterinarians were mainly given a role of a therapist, rather than a role in disease prevention or animal health promotion on the farms.

3.4. Veterinarians' curative answer to animal disease problems does not meet organic farmers' objectives

Veterinarians' first choice to solve animal disease problems were in most cases based on conventional veterinary medicine. Organic farmers were often not satisfied with the fact that it is the only option

veterinarians offer. These answers to animal disease problems were not always in agreement with organic dairy farmers' objectives to reduce the number of chemical treatments on their farms and the organic regulation. This could be expressed by difference in treatment thresholds between farmers and veterinarians.

IF10: 'So, hmm, I used to use antibiotics at drying-off from [an individual somatic cell count level of, Ed.] 300.000, and then the veterinarian said to me; "no, it should be at 200.000", what does that mean? Well, if I do that I treat systematically (...) well, yes, I told him 'I cannot, it is like...anthelmintics, it cannot be systematically [it is not allowed according to the organic production regulation]. It can...if the animals are ill (...) I do not normally have the right.'

Furthermore, the treatment objectives for farmers could differ from that of veterinarians. Farmers could aim for promoting health (reinforcing immunity) and veterinarians could aim for cure, as illustrated below.

IF8: 'Like, apparently, we managed to reduce the [infection] pressure, last year, it was not too bad at the level of the somatic cell count, it was at an interesting level, so we went for phytotherapy to try to work on the immunity of the animals, always with a faecal egg count test for monitoring, to know where we are. Because I am in favour of slowing down [on treatments, Ed.], but not blindly, because one day it will back-fire on me. So, we monitor afterwards to know where we are, and of course. Of course, as soon as we see three eggs [of parasites], we should bomb [according to the veterinarian, Ed.]. We have intervention levels that are a little bit higher. Otherwise, we will never succeed. If we wipe everything clean, there is no immunity. We act based on alert levels that are a little bit higher. It is here, in terms of advices, sometimes they scare themselves...'

Farmers could also be reluctant to ask veterinarians for further diagnostics tests or advice because they felt that in the end the outcome would be that veterinarians as a first choice would propose to treat with conventional veterinary medicine anyway.

IF14: 'For me it [our working relationship with veterinarians, Ed.] is limited to diseases...parasites, coccidiosis, yes, things like that where he explains and it is interesting, it is interesting also because they have an experience...and it allows to detect symptoms. We can also work well with them on analyses for example, milk analysis, faecal analysis, but well it ends there

JD: It is not an analysis with a discussion afterwards on how to deal...

IF14: No, because I know very well that...I will not necessarily listen so...

Wife IF14: because they don't have any alternative to propose than...

IF14: than antibiotics

Wife IF14: only antibiotics or chemical products.'

3.5. Unfulfilled request for support to in alternative medicine and/or disease prevention

Farmers' expectations of their veterinarian varied widely from 'only intervention in emergencies' to 'more involvement in the development of agriculture in general'. As presented in detail below, farmers felt that they had insufficient support, mainly in two areas, namely disease prevention and alternative medical treatments. Some farmers asked for more support in one of the two domains, and others in both.

3.5.1. Alternative medicine, an opportunity for veterinarians to collaborate according to organic farmers

Regarding alternative medicines, farmers expressed different levels of expectations for their veterinarians. It ranged from having a

veterinarian that only sells alternative medicines is sufficient, to veterinarians that are open-minded towards and looking for alternative solutions to chemical drugs, and finally veterinarians that are able to advise farmers on their use. As farmer IF5 expressed: 'They [the veterinarians, Ed.] are not looking for other solutions. That is a pity.' As a result, farmers often educated themselves on the use of alternative medicine through courses organised by local (organic) farmer groups or agricultural institutions. Farmers bought alternative medicines, if not sold by their veterinarian, from local pharmacies or specialized companies. Alternative medicine was the first choice in treatment options for four farmers in the study (Table 2), although they all used conventional veterinary medicine if needed. Most farmers made use of both alternative and conventional veterinary medicine.

IF7: 'They [the veterinarians, Ed.] are eager to get information, on what we do, in the domain of homeopathy, aromatherapy, they are very eager. It really surprises us. We are well complementary to each other, there is a good partnership, ehm,...with regard to our differences, our approaches, and ehm. And indeed, with aroma- and homeopathy we cannot solve everything, sometimes, well...well we need the prescription.'

All the interviewed farmers using alternative medicine did this without consulting their local veterinarian. Some veterinarians sold alternative medicine to farmers, although they rarely provided farmers with advice on their use. Farmers experienced situations in which the veterinarian sold alternative medicine but told the farmer that he/she did not believe in the effectiveness of these products. Other veterinarians asked farmers about the results that they obtained using alternative medicines or expressed an interest in alternative treatment but a lack of time to invest to train themselves on the subject.

The fact that the medicine proposed was not always in agreement with farmers' preferences had in a few cases severe consequences on the relationship between the farmer and the veterinarian. Examples were stated in which one or the other party decided to reduce the working relationship to what is strictly needed.

IF5: 'So he [the veterinarian, Ed.] came to suture [a cow, Ed.], and he said; "we will give her a product to eliminate the toxins, so that she will not..." And we, we said to him; "wait, we have what is needed, we will give her..." We had from company X what was needed to make her pee, in fact, it was very simple, to remove everything that could cause an oedema. After that, he did not talk to us anymore. Well, he did not talk to us anymore... He did his job, but... it did not go any further. He was not... He said; 'they perform their medicine at the side. It is a bit ... voodoo-style.'

3.5.2. Farmers identify missed opportunities to work on disease prevention with veterinarians

Regarding disease prevention, a number of farmers criticised their veterinarians for not taking a pro-active approach to reflect and discuss with them on the possible origin of disease problems on their farms.

IF1: 'For me, that is what I reproach. To explain us, tell us what the probable causes are. And to tell us, yes, on what we should work. For example, everything that is about hygiene, we are aware of that. But he does not pronounce the word. He arrives, he treats... (...) even if he comes just here in an emergency, well, I would like him to tell me, to ask me questions,...That is what I reproach him.'

Some farmers felt that only they themselves or other actors intervening on the farm questioned the origin of (recurrent) health problems. Farmers expected of veterinarians to do the same, as illustrated by IF5 below.

IF5: 'The other day the hoof trimmer came. He told us why [we have diseases](...) He said: 'there is a problem. You have a problem with the bedding that heats up, or you might have a problem with the surface of the concrete, or things like that', and he explained all of that. He

explained why the abscess was on the side of the hoof (...) I found that very good. I believe that veterinarians should do that too. When you have always the same case, that comes back regularly, at that moment, you have to ask yourself some questions.'

According to farmers opportunities for discussing disease prevention were: either when the veterinarian is on the farm for a (recurrent) health problem of an individual animal or during the annual mandatory visit.

IF10: *'The annual mandatory visit, it should be for that, to step back and...to re-examine the feeding system. To look for the flaws. That is what I miss.'*

The French law makes it compulsory to have an annual visit from the veterinarian delivering medicines to the farm, in order to evaluate herd health with the farmer. In practice, a mandatory annual visit is performed during which herd health is assessed. The assessment is based on morbidity and mortality indicators, treatment records, the animal husbandry situation and additional diagnostics test if deemed necessary. In theory, the results of the evaluation should lead to recommendations for an animal care protocol for the farm (Anonymous, 2007).

One farmer (IF7) suggested setting up a contract with the veterinarian in which health objectives would be stated, aiming at developing a different type of partnership with the veterinarians. As he stated: *'if the veterinarian is very good, he must be a partner of the farm, for me he must be more than a caregiver (...) To anticipate health problems of the herd, that, is for me the place of the veterinarian.'* IF8 already used the paid advisory services of a different veterinarian than his local veterinarian, to provide him with advice on production and reproduction performances of the herd.

3.5.3. Veterinarians' attitude does not always promote farmers' trust in the quality of veterinary advice

Farmers questioned veterinarians' ability to provide them with advice if they just come to the farm to treat ill animals and then quickly leave. Numerous farmers felt that veterinarians often were in a hurry, although they acknowledged and understood that veterinarians had busy working days. For example IF5 stated: *'They work...it is impressive how much they work (...) veterinarian X, day and night we can call him'*. Veterinarians often seemed to be taken up by emergencies leaving no time for other activities. According to some farmers, it was due to this lack of time that some veterinarians do not take the time to walk around the farm, take time understand how farmers work and to reflect with farmers on the animal health situation of the herd. According to farmers this is necessary to understand the origin of disease problems and be able to provide pertinent advice on how to correct them.

IF10: *'They [the veterinarians, Ed.] will not necessarily look at the environment, you need to take time to do that. It is not easy. They are caught up in that thing [emergencies, Ed.]'*

This time pressure was experienced during farm visits of veterinarians for individual disease problems of an individual animal, but it also influenced in some cases on the amount of exchanges the farmers and veterinarians had during the annual mandatory sanitary visit.

Farmers sometimes regretted the fact that their veterinarian did not use their experience, built up by visiting different farms and encountering different situations every day, to exchange with them on possible effective practices seen in other farms. This sometimes influenced on the trust they have in the quality of veterinary advice and ultimately on their willingness to pay for it, as illustrated below.

JD: *'Would you be willing to pay the veterinarian for advisory services?'*

IF1: *I do not know. I would have to be sure that he has the competences. Because I am not sure that when doing operations all the time, having a curative role, he...he stands back, if he doesn't interrogate. Because it is*

by confronting all the farm strategies that, that allow to give good advice, on what is being done better elsewhere.'

In other words, in order to be able to give advice, certain farmers expected veterinarians to show that they have a reflective and pro-active posture in trying to analyse and understand the origin of the herd health situations. Another way to accomplish this, as suggested by the farmer below, is to review regularly herd health data, such as medicine consumption.

IF8: *'But we see that veterinarians do not review. We should have it [an annual review report on herd health. Ed] every year and for everybody, but it is not done (...) The number of boxes of antibiotics used, it allows to know, more or less, how many mastitis cases there have been and to ask questions related to that. But there are not many veterinary clinics that do it. And if we want to enter, in terms of advice, on a farm, for me it is a must.'*

In addition, for farmers who used alternative approaches in health management, that require time to observe the animals to diagnose a disease problem, the fast intervention of veterinarians did not always match with their approach.

IF14: *'It always has to go fast. Everything is done in emergency mode. Even when they come to nurse a cow...That is why it is not compatible with another system [alternative methods]'*

In the example above the farmer refers to his use of a French animal observation method that links clinical signs to the identification of nutritional misbalances. To use this method, time for close observation is needed both of individual animals and the herd as a whole. Some veterinarians also explained to the farmers that they could not invest more time in training themselves for example in alternative medicine. Some farmers questioned whether this was due to a lack of time or lack of possible return on investment due to the fact that the organic dairy sector represents a small proportion of their clients.

3.5.4. Farmers question veterinarians' credibility as advisors because they sell drugs

Several farmers questioned the credibility of veterinarians as advisors to promote health as they earn money from the sale of drugs and the cure of ill animals. Some farmers questioned veterinarians' impartiality and independence from the pharmaceutical industry.

IF6: *'We have the impression that medicine that...that the sale of medicine is important for them [the veterinarians] (...)*

JD: *Would it be imaginable that veterinarians one day sell advice?*

IF6: *Well, we are not looking for, we would not expect advice to come from them (...) we would be surprised if advice would come from them, because they will certainly be at loss. We look for it in farmer exchange groups in fact, amongst producers, and from external speakers. Vets like...Yes, and there are vets that, that do it [intervene as experts in farmer exchange groups] because they do not have the same approach. They are neutral in fact, in the end, because they do not sell anything.'*

Some farmers explicitly stated how they appreciated when their veterinarian did not push them to buy or use medicine. Furthermore, farmers' trust in veterinarians independence could also influence on the image of related activities provided by veterinarians, as shown in the example below.

JD: *'And do they [the veterinarians, Ed.] provide sometimes education for farmers?'*

IF12: *Eh well, we have been invited sometimes...I never go because it is more for the companies that sell the...anthelmintics and everything like that...'*

3.6. Farmers are optimistic that the new generation of veterinarians will better meet their expectations

Some farmers had already experienced that the new generation of veterinarians seemed more open to exchange and/or showing more openness towards organic farming. This made some farmers express the hope that the new generation of veterinarians would better meet their expectations compared to the generation of veterinarians close to their retirement.

IF8: ‘So veterinarians, in general, they say: ‘the organic [farms, Ed] when we go there, it is always bad’. That is the first thought. For the guys that have 50–55 years, it is: ‘Where is it going?’ Gradually, we relax. (...) The young ones are different, also because there are more people in organic. It has been growing, so they have more experiences working in the farms, technical farms or not, but in different systems. So the organic are gaining importance in the clientele, in terms of numbers. Not in terms of sales but in numbers. So obviously, they ask themselves different questions when that happens.’

Some farmers explained the differences between generations by the fact that veterinarians will have more experiences with organic dairy farmers than veterinarians had in the past, as there are more organic farms today. Furthermore, farmers reflected on the fact that certain young veterinarians showed a personal interest in organic farming e.g. by eating or producing organic themselves.

3.7. Farmers appreciate continued education and farmer experience exchange groups

All farmers participated regularly in farmers’ education and/or exchange groups, except for two farmers who preferred to inform themselves in another way, such as reading or informal exchange with colleagues. Farmers participated in courses given by a specialist on a specific topic that are organised by local Chambers of Agriculture and/or other (organic) farmers’ organizations. Farmers’ experience exchange groups were also considered by several farmers as important sources of information for the management of their farm and herd health. These groups had in common that the farmers visit in turns each other’s farms and discuss the farm project and/or problems. Sometimes, other topics were discussed as well with an invited expert or economic figures of the farms were compared. Some farmers were participating in several groups at the same time and farmers were not always in groups specific to organic farming.

Characteristics of these courses and groups that were highly valued by the farmers were: the opportunity it creates to exchange on experiences and on the results of practices and products used. Moreover, it was considered by some farmers as an opportunity to collect external opinions on their farm or problems and thus to step out of their daily routine and view with a renewed look at his or her farm and practices.

IF13: ‘Yes, well, I believe that working in a group is more rewarding than having a personal advisor (...) I meet people that are organic, but in all kinds of [farming Ed.] systems. So, with a lot of different things and you have to take the best...’

Another positive aspect of these groups, sometimes mentioned by farmers, is that they consider the invited experts as independent and not participating with the aim to sell something.

3.8. Understanding why veterinarians’ approach of animal health does not always match with the approach of farmers

Several points could be identified were veterinarians’ approach of animal health, as farmers perceived it, did not meet organic dairy farmers’ health approach (Fig. 1). First, organic farmers seem to have a long term strategy focused on animal health promotion. According to farmers, veterinarians mostly focus on short term solutions, curing a

disease. In addition, veterinarians did not have a pro-active attitude to find more sustainable solutions to disease problems (having an advisory posture). And farmers could question the credibility of veterinary advice on animal health promotion when at the same time veterinarians earn money from selling drugs. Second, sometimes veterinarians’ solutions to disease problems (conventional veterinary medicine) were not in line with organic dairy farmers’ objectives of minimizing the use of chemical products and they cannot provide veterinarians with other solutions. Third, certain farmers expressed that they would like to learn from veterinarians. Farmers would like to exchange more with veterinarians on practices that could be beneficial to herd health and receive feedback on their herd health situation and practices. This would require a reflective attitude from veterinarians. Farmers participating in continued education and/or farmers’ experience exchange groups had very positive experiences with this. The characteristics of these activities can, at least partially, explain why they were perceived as positive by farmers and why they sometimes were in contrast with the approach of veterinarians (Fig. 1, grey circles). Advisors invited to participate in these groups were often regarded as independent, when they did not sell (veterinary) products. Moreover, these groups were a source of information for farmers on different practices to manage the farm and the herd. The exchange of experience and practices amongst farmers, but also with the advisors was highly valued and was often missed in their collaboration with their veterinarian.

4. Discussion

4.1. Understanding the therapeutic role of veterinarians on organic dairy farms

This is, to our knowledge, the first study conducted to explain, from the perspective of French organic dairy farmers, the role veterinarians are taking in organic farms and the role veterinarians are given by farmers. A detailed understanding of the dynamics of their collaboration has been lacking as prior studies focused on the animal health strategies of farmers and not of the role of veterinarian herein (Vaarst et al., 2006, 2003). Furthermore, the results of this study gave us the not common opportunity to put into perspective the results of a recent study, studying veterinarians’ point of views on their role in organic dairy farms which was conducted in the same geographic area and period in time. Indeed, comparing the results of these studies show that veterinarians and organic dairy farmers seem stuck in an impasse. Farmers expect veterinarians to have a pro-active approach in getting involved in disease prevention and veterinarians seem to be waiting that farmers ask explicitly for their involvement (Duval et al., 2016a). In both studies veterinarians had mainly a therapeutic role on organic dairy farms.

Veterinarians explained that they were not always able to have an advisory role on organic dairy farms, even on farms with animal health situations that were below their expectations (Duval et al., 2016a). Interestingly, certain organic dairy farmers interviewed in this study, even without important health problems on their farms at the time of the interview, expressed a demand for veterinarians’ support in disease prevention and reported a lack of veterinarians’ pro-activeness to develop an advisory role. Some of the interviewed farmers expressed that when they trusted the quality of the advice given, they were not opposed to paying advisors for advisory services. This was supported by the fact that some farmers already used paid services in animal health but from advisors other than their local veterinarian. Indeed as we have seen and as discussed by Garforth (2015) farmers decision are not only driven by financial motives, but also e.g. by their values, the pertinence of advice to their farm specific situation, their practices.

4.2. Veterinarians working in an organic context

The question remains thus which factors could be decisive in

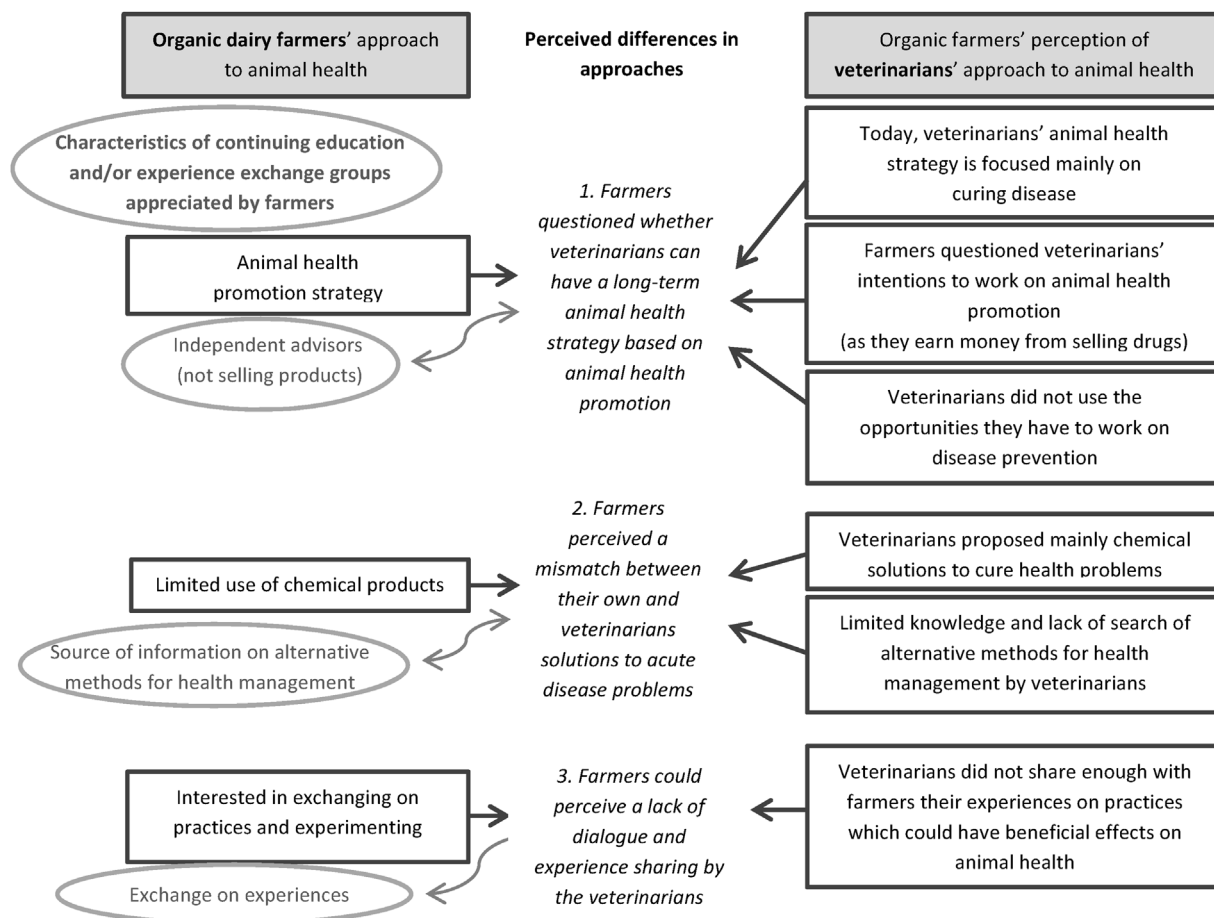


Fig. 1. Model of understanding illustrating why veterinarians' approach to animal health does not always match with organic dairy farmers' approach. Farmers' main strategies and objectives regarding animal health management are based on an animal health promotion strategy and the objective to reduce the use of conventional veterinary products (white boxes on the left-side). Examples of reasons why the perceived animal health practices of veterinarians did not correspond to farmers' approach are listed in the opposite column (white boxes on the right side). Three main points were identified where farmers' approach of animal health does not match with that of veterinarians: 1) Farmers questioned whether veterinarians can have a long-term health strategy that is based on animal health promotion, 2) they observed mismatch between farmers and veterinarians regarding solutions to acute disease problems and 3) they experienced a lack of dialogue and experience with veterinarians. These 3 reasons help to explain why veterinarians' role on organic dairy farms is limited to a therapeutic role. Furthermore, it illustrates, at least partially, farmers their appreciation of continuing education and/or farmer exchange groups. Certain characteristics of these activities/groups (as illustrated in the circles) are more in line with farmers' approach of animal health management which can explain farmers' more positive experience of the activities compared to veterinary advice.

organic dairy farmers' decision to actively involve or not the veterinarian in his or her animal health promotion strategies. The added value of this study is that it allowed identifying and understanding reasons that seem to be specifically related to the organic context influencing the quality of the farmer-veterinarian relationship.

Organic farmers' goal of animal health promotion went beyond veterinarians' therapeutic approach. Farmers perceived that veterinarians had a focus on disease which did not correspond to farmers' animal health management practices aiming at animal health promotion. Farmers' approach was in line with the organic principles and regulation and health issues required thus a whole farm approach. When adopting a holistic approach to health, like in organic farming, the use of pesticides, fertilizers and chemical drugs can be considered to be potentially harmful to health (International Federation of Organic Agriculture Movements (IFOAM, 2005). Veterinarians' focus on disease might explain why they often choose the use of chemical solutions when faced with animal health problems. Organic dairy farmers on the contrary might be more reluctant to use these due to their objective to produce more environmental friendly. These different objectives resulted in different, sometimes opposing practices by organic dairy farmers and their veterinarians.

Duval et al. (2016a) also presented the example of organic dairy farmers' aim for naturalness as a precondition for health which can be

in conflict with veterinarians' priority for physical health. Opposing practices, originating from different priorities, have been identified during the interviews with both French organic dairy farmers and veterinarians. These differences can result in difficulties encountered in their collaboration and it can sometimes lead to situations in which communication is reduced to the bare necessities, with no exchange of experience and lack of trust in veterinarian's role as an advisor in animal health. This is possibly due to lack of understanding and reflection of both parties involved upon the nature and origin of these differences.

Certain farmers expressed the wish to have advice from veterinarians on alternative medicine. Veterinarians identified this growing demand too and responded to that in different ways, depending on the interest found in organic farming and their own opinion towards alternative medicine (Duval et al., 2016a). The interest in alternative approaches in the management of animal health is growing in other sectors notably due to the problems associated with antimicrobial resistance (EMA and EFSA, 2017). Today, the regulation on organic dairy farming, for one, holds the situation in an impasse by being vague on what is considered an inappropriate therapy (Council regulation (EC) No 834/2007). Veterinarians' biomedical values can discard alternative medicine, such as homeopathy, if they do not meet the scientific standards to prove their efficacy (Hegelund, 2004). Veterinarians can thus consider homeopathy as inappropriate. Hegelund (2004) touched upon

the fact that the holistic approach of homeopathy, considering the animal and its environment when trying to understand the cause of the disease, shows similarities with veterinarians overall approach of herd health. This holistic approach of health problems corresponds to what is considered to be needed in disease prevention and is part of health management by the veterinary community (LeBlanc et al., 2006). This could possibly be an area where veterinarians can get back into the picture so to speak. The holistic approach could be an opening to open the discussion on farm practices and animal health. Veterinarians can make the link between the animal, its environment, management practices and health outcome. However, veterinarians are not the only advisors in domains like nutrition and housing (LeBlanc et al., 2006; Ruston et al., 2016). It might be one of the explaining elements of the observed difficulty that veterinarians have to maintain an advisory role on (organic) dairy farms, if they do not manage to put forward how they can link herd health to farm practices.

Another barrier of the organic context which could remain is the fact that certain veterinarians' declared that they did not find an economic interest in investing in the development of advisory service specifically for organic dairy farms. Moreover, veterinarians did not always find an added value in organic farming, as their primary focus was animal health and some veterinarians experienced disease level on organic dairy farms which was below their expectations (Duval et al., 2016a). This is in contrast to wider view of farmers, who found organic farming interesting and were motivated to convert their farm to organic because they wanted to develop their farm with regard to environmental, health related and economic perspectives.

4.3. Veterinarians advisory attitude

In addition to the difficulties that might be explained due to the organic production context other non-specific factors known to influence advisory relationship played a role too, such as the advisory attitude of the veterinarian. An advisory role requires different knowledge and skills, and veterinarians' qualifications for that role can be questioned by farmers (Kristensen and Enevoldsen, 2008). Having a pro-active advisory approach has been identified as a crucial element in the transfer of knowledge and motivation by veterinarians, in order for dairy farmers to successfully adopt preventive measures to ensure e.g. udder health (Lam et al., 2011). Kleen et al. (2011) described that a role in long-term prevention of health problems requires different levels of mutual trust and shared knowledge between farmer and veterinarian than a transitory problem-focused role. Dealing with the long-term prevention of health problems, is more labour intensive and requires, amongst other, the identification of goals, data analysis and a continuous process of herd health monitoring and intervention when needed (Kleen et al., 2011). The fact that farmers apparently did not change of veterinarian, except for one, to have access to preventive advisory services further suggests that it is indeed not an easy role to acquire.

Farmers in this study agreed with veterinarians' view that they need to promote preventive advisory services if they want farmers to adopt it (Duval et al., 2016a; Ruston et al., 2016; Shortall et al., 2016). It further stresses the apparent need, already identified by veterinarians, to be trained in the effective communication and promotion of veterinary herd health advisory services (Ruston et al., 2016; Shortall et al., 2016). Other methods have been described to initiate the dialogue between organic dairy farmers and their advisors in animal health. A participatory approach has been described to design a herd health monitoring system adapted to farm specific situation and which stimulates at the same time the dialogue between farmer and advisor, on e.g. farmers' objectives (Duval et al., 2016b).

Further, certain farmers experienced a lack of trust in veterinarians' independence towards the pharmaceutical industry or veterinarians' dependence of treating ill animals. This can lead to situations of lack of trust in the advice given, since farmers question veterinarians'

intentions. Kleen et al. (2011) recommend separating the advisory services aiming for the prevention of health problem from the problem-focused services, in order to assure the quality and suggest that it might facilitate billing for advisory services. Farmers mentioned spontaneously alternative organizations of advisory services possibly between farmer and veterinarians, such as contracts or collaboration with veterinarians that only provide advisory services on herd health management and production. Indeed, since a couple of years there has been a rise in France in the number of farmers' organizations that have developed veterinary services. In a recently published work by Ruault et al. (2016), two cases were presented. The reasons for contracting veterinary services were to assure the continuity of veterinary services in a remote area for one case and a need to create an environment to find and exchange and technical advice for farmers who aim to develop low-input farming systems. Farmers did not pay veterinarians' interventions but paid an annual fee based on their herd size. In exchange, veterinarians provided farmers with; 1–3 visits a year, interventions when needed, advice by telephone, training and excursions. Farmers' appreciation of this organization of the collaboration was based on the quality of the relationship they had with their veterinarian, namely a discussion focused on the understanding of the disease and a shared discussion between farmer and veterinarian on the possible origin of problems or practices to prevent disease. This was the opposite of other relationships that farmers had encountered, which resembled situations described in this study where the veterinarians comes in, does not explain the origin of the problem and imposes a solution to farmers (Ruault et al., 2016).

4.4. Organic dairy farmers' taste for learning with peers

The transfer of information and learning with peers seemed to be important to the interviewed organic dairy farmers, although we could not compare whether it is more important than in conventional farming systems. Farmers can have different learning styles, thus ideally for the transfer of knowledge these should be bared in mind (Lam et al., 2011). Vaarst et al. (2007) described Danish organic farmers' appreciation for situations of common learning to reach a common goal, in that case phasing out the use of antimicrobials. Their positive opinion was related to the opportunity it represented to learn from experiences of other farmers and the mutual trust and the feeling of equality between participants for example (Vaarst et al., 2007). Although the farmers interviewed in this study often invited an external expert to their farmer groups, a similar appreciation of farmer groups by farmers was found in the French context.

Historically, compared to conventional agriculture, organic agriculture received relatively little support from governments, the scientific community and agricultural extension organizations. Organic farmers have mainly found support from each other to develop their farming system and practices (Padel, 2001). Even though the organic dairy sector has been growing and is now more widely spread, veterinarians still considered organic dairy farming as a niche market (Duval et al., 2016a). In situations in which farmers do not find references for non-conventional production methods, exchanging with colleagues has been showed to be a way to construct knowledge. It has been shown that from the observation, analysis of individual experiences and its reconstruction in more general lessons learned, farmers can learn from peers, when exchanging knowledge in groups (Goulet, 2013). The farmer groups to which farmers referred to did not have a common goal, like the Stable Schools described by Vaarst et al. (2007) and had different compositions, promoters and objectives. It would be interesting to study further the farmer groups on animal health management to be able to understand its value; identifying what kind of learning processes occur, determining what kind and in which way knowledge is constructed and which factors contribute to its perceived success (social aspects, bottom-up approach, advice adapted to the context, etc.).

4.5. Qualitative research interviews to understand the limited role of veterinarians in organic dairy farmers' animal health promotion strategies

The aim of a qualitative interview study is to gain a better understanding of a certain phenomenon as it is experienced and explained by the subjects under study before providing scientific explanations. And like in any research design, choices are made that can influence research study outcomes. In qualitative interview studies the researcher is the instrument used during the whole research process, with its own preconceptions of the phenomenon under study. This requires thus a constant reflection of the researcher on its role of the research process. Moreover, in qualitative interview studies knowledge is created through the interaction between interviewee and interviewer. Qualitative research acknowledges that subjects are actors and at the same time influenced by their environment (Brinkmann and Kvale, 2015; Malterud, 2001). In this study the aim was to better understand the role of the veterinarian on organic dairy farms based on farmers' context and experiences. And not solely describing the role of the veterinarian in a representative sample of organic dairy farms. The aim of qualitative research interview studies is to show the range of variation rather than quantification, aiming to explain the context and choices made (Brinkmann and Kvale, 2015). The results of these studies cannot be generalized and should be used in their context (Malterud, 2001). However, in this study it is interesting to note that the population under study was of particular interest. It could be considered as what Flyvbjerg (2006) considered as 'critical cases'. Interviews were conducted in a 'critical population' as they were conducted in an area with a relative high percentage of organic dairy farms and with the confirmed presence of veterinarians providing herd health advisory services. We hypothesized that in this area we would have the highest chance to find veterinarians in an advisory role on organic dairy farms. The fact that we most often found veterinarians in a therapeutic role in this area suggests that in other geographic areas veterinarians are probably not more implicated in organic dairy farmers' animal health promotion strategies. Despite our selection criteria for interviewees, we did not interview farmers that had a veterinarian that had an important role in farmers' animal health promotion strategy. The selection criteria herd size and number of years certified as organic did not seem to have an impact on the quality of the farmer-veterinarian relationship. It would have been interesting to study cases in which veterinarians did have an advisory role in farmers' herd health strategies to try to identify how that relationship had developed and understand the 'success factors'.

5. Conclusion

In the interaction between veterinarians and organic dairy farmers, veterinarians are mainly taking and given by farmers the role of therapists in the animal health management on organic dairy farms. That is despite a demand from certain farmers for more involvement of veterinarians, mainly in disease prevention and/or alternative treatments. Farmers did not always consider veterinarians as potential advisors. Organic dairy farmers had an animal health management strategy focusing on animal health promotion, in contrast to veterinarians whom they perceived to have a focus on disease. Furthermore, farmers' (organic) objectives, values and priorities are not always shared by the veterinarians which can be the origin of their disagreement on the best choice in animal health management practices. Veterinarians seem thus in need to improve their understanding of organic dairy farmers' demands and adapt their advisory services in order for it to be acceptable to farmers, but this will require an investment by the veterinarians. Farmers too could benefit from understanding veterinarians' background and reasons for action. Reinforcement of the dialogue between the two 'worlds' could be a good starting point, to move forward in search for innovative solutions in animal health management. Due to the importance of continuing education and experience exchange groups to organic dairy farmers, it would be of

interest to study further their value in animal health promotion.

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References

- Agence, B.I.O., 2015. La bio dans les territoires 2015. Les carnets de l'Agence BIO Edition 2015.
- Anonymous, 2007. Décret n°2007-596 du 24 avril 2007 relatif aux conditions et modalités de prescription et de délivrance au détail des médicaments vétérinaires et modifiant le code de la santé publique (dispositions réglementaire).
- Développement des conversion lait bio: une chance et une opportunité pour la filière et pour la planète. Press release Agrobio Basse-Normandie. CAB Pays la Loire, FRAB Bretagne.
- Barkema, H.W., Keyserlingk, M.A.G., Von Kastelic, J.P., Lam, T.J.G.M., Luby, C., Roy, J.-P., LeBlanc, S.J., Keefe, G.P., Kelson, D.F., 2015. Invited review: changes in the dairy industry affecting dairy cattle health and welfare. *J. Dairy Sci.* 98, 1–20. <http://dx.doi.org/10.3168/jds.2015-9377>.
- Brinkmann, S., Kvale, S., 2015. *InterViews Learning the Craft of Qualitative Research Interviewing*, third edit. ed. SAGE Publications, Inc, London.
- CNIEL, 2015. Lait biologique en France Collecte, fabrications et commercialisation. Année 2014. (Paris).
- Cabaret, J., Benoit, M., Laignel, G., Nicourt, C., 2011. Health advisors in organic meat sheep farms: the role of the veterinarians. *Open Vet. Sci. J.* 5, 7–11.
- Charmaz, K., 2014. *Constructing Grounded Theory*, second ed. SAGE Publications Ltd., London.
- Council regulation (EC) No 834/2007 on organic production and labelling of organic products and repealing Regulation (EEC).
- Derks, M., van Woudenberg, B., Boender, M., Kremer, W., van Werven, T., Hogeveen, H., 2013. Veterinarian awareness of farmer goals and attitudes to herd health management in The Netherlands. *Vet. J.* 198, 224–228.
- Duval, J.E., Bareille, N., Fourichon, C., Madouasse, A., Vaarst, M., 2016a. Perceptions of French private veterinary practitioners on their role in organic dairy farms and opportunities to improve their advisory services for organic dairy farmers. *Prev. Vet. Med.* 133, 10–21. <http://dx.doi.org/10.1016/j.prevetmed.2016.09.008>.
- Duval, J.E., Fourichon, C., Madouasse, A., Sjöström, K., Emanuelson, U., Bareille, N., 2016b. A participatory approach to design monitoring indicators of production diseases in organic dairy farms. *Prev. Vet. Med.* 128, 12–22. <http://dx.doi.org/10.1016/j.prevetmed.2016.04.001>.
- European Medicines Agency and European Food Safety Authority, EMA and EFSA Joint scientific opinion on measures to reduce the need to use antimicrobial agents in animal husbandry in the European Union, and the resulting impacts on food safety (RONAFA). *EFSA J.* 15, 245. <http://dx.doi.org/10.2903/j.efsa.2017.4666>.
- Flyvbjerg, B., 2006. Five misunderstandings about case-study research. *Qual. Inq.* 12, 219–245. <http://dx.doi.org/10.1177/1077800405284363>.
- Garforth, C., 2015. Livestock keepers' reasons for doing and not doing things which governments, vets and scientists would like them to do. *Zoonoses Public Health* 62, 29–38. <http://dx.doi.org/10.1111/zph.12189>.
- Goulet, F., 2013. Narratives of experience and production of knowledge within farmers' groups. *J. Rural Stud.* 32, 439–447. <http://dx.doi.org/10.1016/j.jrurstud.2013.09.006>.
- Green, M., Green, L., Huxley, J., Statham, J., Statham, S., 2012. Concepts in dairy herd health. In: Green, M., Bradley, A., Breen, J., Green, L., Hayton, A., Higgins, H., Hudson, C., Huxley, J., Statham, J. (Eds.), *Dairy Herd Health*. CAB International, Wallingford, pp. 1–10.
- Gunn, G.J., Heffernan, C., Hall, M., 2008. Measuring and comparing constraints to improved biosecurity amongst GB farmers, veterinarians and the auxiliary industries. *Prev. Vet. Med.* 84, 310–323. <http://dx.doi.org/10.1016/j.prevetmed.2007.12.003>.
- Hall, J., Wapenaar, W., 2012. Opinions and practices of veterinarians and dairy farmers towards herd health management in the UK. *Vet. Rec.* 170.
- Hegelund, A., 2004. *Veterinary Paradigms and Practices*. PhD Thesis. The Royal Veterinary and Agricultural University of Copenhagen.
- Hovi, M., Gray, D., Vaarst, M., Striessel, A., Walkenhorst, M., Roderick, S., 2004. Promoting health and welfare through planning. In: Vaarst, M., Roderick, S., Lund, V., Lockeretz, W. (Eds.), *Animal Health and Welfare in Organic Agriculture*. CAB International, Wallingford, pp. 253–277.
- International Federation of Organic Agriculture Movements (IFOAM), 2005. *Principles of Organic Agriculture*. IFOAM.
- Kaler, J., Green, L.E., 2013. Sheep farmer opinions on the current and future role of veterinarians in flock health management on sheep farms: a qualitative study. *Prev. Vet. Med.* 112, 370–377. <http://dx.doi.org/10.1016/j.prevetmed.2013.09.009>.
- Kleen, J.L., Atkinson, O., Noordhuizen, J.P.T.M., 2011. Communication in production animal medicine: modelling a complex interaction with the example of dairy herd health medicine. *Ir. Vet. J.* 64, 1–7. <http://dx.doi.org/10.1186/2046-0481-64-8>.
- Kristensen, E., Enevoldsen, C., 2008. A mixed methods inquiry: how dairy farmers perceive the value(s) of their involvement in an intensive dairy herd health management program. *Acta Vet. Scand.* 50, 50. <http://dx.doi.org/10.1186/1751-0147-50-50>.

- Lam, T.J.G.M., Jansen, J., van den Borne, B.H.P., Renes, R.J., Hogeveen, H., 2011. What veterinarians need to know about communication to optimise their role as advisors on udder health in dairy herds. *N. Z. Vet. J.* 59, 8–15. <http://dx.doi.org/10.1080/00480169.2011.547163>.
- LeBlanc, S.J., Lissemore, K.D., Kelton, D.F., Duffield, T.F., Leslie, K.E., 2006. Major advances in disease prevention in dairy cattle. *J. Dairy Sci.* 89, 1267–1279. [http://dx.doi.org/10.3168/jds.S0022-0302\(06\)72195-6](http://dx.doi.org/10.3168/jds.S0022-0302(06)72195-6).
- Malterud, K., 2001. Qualitative research: standards, challenges, and guidelines. *Lancet* 358, 483–488. [http://dx.doi.org/10.1016/S0140-6736\(01\)05627-6](http://dx.doi.org/10.1016/S0140-6736(01)05627-6).
- Mee, J.F., 2007. The role of the veterinarian in bovine fertility management on modern dairy farms. *Theriogenology* 68 (Suppl. 1), S257–65. <http://dx.doi.org/10.1016/j.theriogenology.2007.04.030>.
- Padel, S., 2001. Conversion to organic farming: a typical example of the diffusion of an innovation? *Sociol Ruralis* 41, 40–61. <http://dx.doi.org/10.1111/1467-9523.00169>.
- Pieper, L., 2014. *Johne's Disease Prevention and Control on Organic Dairy Farms in Ontario, Canada* PhD Thesis. University of Guelph.
- Richens, I.F., Honsen-West, P., Brennan, M.L., Lowton, R., Kaler, J., Wapenaar, W., 2015. Farmers' perception of the role of veterinary surgeons in vaccination strategies on British dairy farms. *Vet. Rec.* 1–6. <http://dx.doi.org/10.1136/vr.103415>.
- Ruault, C., Bouy, M., Experton, C., Patout, O., Koechlin, H., Sergeant, O., 2016. Farmers groups in animal health and knowledge sharing between conventional and organic farmers. *Innovations Agronomiques* 51, 89–103.
- Ruston, A., Shortall, O., Green, M., Brennan, M., Wapenaar, W., Kaler, J., 2016. Challenges facing the farm animal veterinary profession in England: a qualitative study of veterinarians' perceptions and responses. *Prev. Vet. Med.* <http://dx.doi.org/10.1016/j.prevetmed.2016.03.008>.
- Shortall, O., Ruston, A., Green, M., Brennan, M., Wapenaar, W., Kaler, J., 2016. Broken biosecurity? Veterinarians' framing of biosecurity on dairy farms in England. *Prev. Vet. Med.* 132, 20–31. <http://dx.doi.org/10.1016/j.prevetmed.2016.06.001>.
- Vaarst, M., Alrøe, H.F., 2012. Concepts of animal health and welfare in organic livestock systems. *J. Agric. Environ. Ethics* 25, 333–347.
- Vaarst, M., Thamsborg, S.M., Bennedsgaard, T.W., Houe, H., 2003. Organic dairy farmers' decision making in the first 2 years after conversion in relation to mastitis treatments. *Livest. Prod. Sci.* 80, 109–120.
- Vaarst, M., Bennedsgaard, T.W., Klaas, I., Nissen, T.B., Thamsborg, S.M., Østergaard, S., 2006. Development and daily management of an explicit strategy of nonuse of antimicrobial drugs in twelve Danish organic dairy herds. *J. Dairy Sci.* 89, 1842–1853. [http://dx.doi.org/10.3168/jds.S0022-0302\(06\)72253-6](http://dx.doi.org/10.3168/jds.S0022-0302(06)72253-6).
- Vaarst, M., Nissen, T.B., Østergaard, S., Klaas, I.C., Bennedsgaard, T.W., Christensen, J., 2007. Danish stable schools for experiential common learning in groups of organic dairy farmers. *J. Dairy Sci.* 90, 2543–2554. <http://dx.doi.org/10.3168/jds.2006-607>.