

Developing best practice networks of health in organic agricultural systems

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Contact:

Anja Vieweger, anja.v@organicresearchcentre.com

The Organic Research Centre, Elm Farm
Hamstead Marshall, United Kingdom

Project consortium

Project leader:

Anja Vieweger
The Organic Research Centre (ORC)
Hamstead Marshall, United Kingdom



Project partners:

Thomas Döring
Humboldt University Berlin (HU)
Berlin, Germany



Rebecca Paxton and Milena Klimek
University of Natural Resources and Life
Sciences (BOKU)
Vienna, Austria



Ralf Bloch and Johann Bachinger
Leibniz Centre for Agricultural Landscape
Research (ZALF)
Müncheberg, Germany



Lawrence Woodward
The Organic Research Centre (ORC)
Hamstead Marshall, United Kingdom



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1. Introduction and aims

The main aim of this project was to provide a basis for the creation of an international network of farmers and scientists, to jointly elaborate new and interdisciplinary approaches to health measurement and health research in ecological agriculture. This will ultimately serve to improve health effects in the entire food system. To provide a common ground for the development of this network, the second aim of this project was to identify which principles, strategies and methods organic farmers have adopted that make them successful in relation to health management on their farms. This has led to the identification of best practice examples in each project country with regards to health and managing healthy agricultural systems. Building on this experience in practice and on findings from a former research project reviewing health concepts in ecological agriculture (funded by the Ekhaga Foundation, project code 2011-74), this project has produced a set of transferable statements to increase the direct translation of organic principles into practice and improve the communication and demonstration of health concepts among all stakeholders. It has further initiated the creation of a best practice network of health in organic agriculture, and has connected farmers and scientists for future collaboration to increase health effects in organic agricultural food systems.

The objectives of this project were:

- A Selection of best practice examples in the UK, Germany and Austria
- B Identification of farmers' own visions and principles of health
- C Identification of commonalities within and across the three countries
- D Identification of priorities and wider transferability of approaches and principles
- E Scientific evaluation of outcomes and definition of research needs
- F Development of training guide/recommendations

This end-report presents the methods used and results found during this 2-year project, describing how all six objectives were met.

1.1 Background and literature

Health is closely linked to agriculture, for example through nutrition and food quality, pesticides, or concerns over health of farm animals. However, despite its importance, health in agriculture remains poorly defined or subject to strong disagreements among and between disciplines. This lack of a clear concept, definition and methodology creates a vacuum in which potentially misleading claims about the health effects of agricultural practices can be made. This is particularly relevant as the debate around agricultural production systems is intensifying to determine how best to respond to various global stresses such as climate change, global population increases, changes in human demographics, changes in lifestyle and diet, biodiversity losses and resource limitations. Since all of these stressors on agriculture are linked to health issues, and health is such an important universal goal, it needs to be clear what is meant by the term, and how health can be assessed and measured.

As stated by Lady Eve Balfour in the mid-twentieth century (Balfour, 1945), a key hypothesis of organic agriculture is the connectedness of soil, plant, animal, man, ecosystem and planet through health; e.g. human health is dependent on healthy soil, plants and farm animals. However, most debates around health have remained disconnected so far; research tended to focus upon health in individual domains (e.g. soil, plant, animal, human and environment), or in relation to specific production practices (Vieweger and Döring, 2015). Although also the philosophical literature on health concepts around human medicine has had little impact on health questions in agriculture, research over the last four to six years has brought up a number of novel developments both in terms of conceptual development (e.g. Döring et al. 2012; Huber et al. 2010) and by producing intriguing insights into how the health of soils, plants, animals and man are linked through various mechanisms. At the same time, recent developments in global food policies (e.g. Foresight report, 2011, on the future of food and agriculture) and global health policies (WHO's World Health Assembly, 2012) necessitate a common and more comprehensive approach to assess health in agricultural systems, and agricultural impacts on health.

The findings of recent research show some significant differences between organic and conventional farming systems (Blanco-Penedo et al., 2012; Garmo et al., 2010; Haskell et al., 2009; Magkos et al., 2006; Lund and Algers, 2003; Weller and Bowling, 2000). Lund and Algers (2003) point out that organic farming research tended to be preoccupied with practical issues, and has perhaps neglected overarching issues or questions that link the domains as a whole. This research might reflect the structural divisions within disciplinary science more than divisions within organic farming practice, in which the health of the domains is interconnected.

Studies have often compared organic to conventional farming, attempting to determine which production system produces more positive health outcomes within individual domains; often focussing on human health, but also the environment, the delivery of public goods etc. Nutritional content of organically produced food products in particular, has often been shown to be higher than in conventional products, as some recent meta-analyses have found (Baranski et al., 2014; Palupi et al., 2012; Brandt et al., 2011; Hunter et al., 2011). Such studies also show the significant, inherently lower content of pesticide residues in organic food products compared to conventional, particularly all fresh produce; due to the fact that pesticide use is largely avoided or prohibited in organic food production. With regards to environment health, the scope is broadened and a wide variety of agro-ecological indicators are evaluated (e.g. Lampkin et al., 2015). Looking at biodiversity as an example, the latest meta-analysis reviewed over 90 studies (Tuck et al., 2014) and selected species richness as a measure of biodiversity, specifically focussing on birds, plants, arthropods and microbes. This study found that organic farming practices increase species richness by 30% compared to conventional, taking standardised measures of land-use intensity and heterogeneity across all studies into account.

Some comparisons suggest that the diversity of management approaches at farm level has a greater impact on the health of livestock than farming system (Sossidou et al., 2015; Marley et al., 2010; Langford et al., 2009; van de Weerd et al., 2009; Tuytens et al., 2008; Valle et al., 2007;

Horning, 1998;), as well as on soil (Arnhold et al., 2014), environmental impact (Schneider et al., 2014) and on product healthiness (Huber, 2014; Dangour et al., 2010; Dangour, 2009).

Two key discussions which are of particular relevance to this project have developed alongside these studies: The first is an ongoing conversation within the organic research community about what health means and how it should be measured. Existing models of health do not reflect what the organic principles mean by health, partly because of the interconnected nature of organic health, but also due to the characteristics and goals that define health in and across domains (Vieweger and Döring, 2015; Huber, 2014; Döring et al., 2012;). For example, it is argued that animal health in organic systems is strongly connected to wellbeing (Vaarst and Alroe, 2012; Vaarst et al., 2004), the “possibility to perform natural behaviour” (Vetouli et al. 2012; Lund, 2006), and resilience (Huber et al., 2010); in addition to biomedical indicators (Thomsen et al., 2012; Mugnai et al., 2011; Wagenaar et al., 2011), which are often related to productivity and efficiency (Pieper, 2012; Mueller and Sauerwein, 2010; Volling et al., 2010; Fall et al., 2008; Valle et al., 2007).

As discussed by Vieweger and Döring (2015), the indivisibility paradigm in organic agriculture can be seen to imply that there can be no health in a farming system unless the system as a whole is healthy, in which case the study of health in each domain must be seen in relation to the health of the whole. This discussion runs parallel to similar discussions about the meaning of naturalness (Vetouli et al., 2012; Verhoog et al., 2003) and sustainability (Alrøe et al., 2005), highlighting that the organic movement finds it necessary to clarify and differentiate their position relative to current uses of these concepts.

Secondly, the findings that management approaches play a key role in health outcomes has encouraged researchers to call for systemic practices (van Bruggen et al., 2016) and participatory studies of health in organic farming (Kahl and Rembalkowska, 2014). Health outcomes of all farming systems therefore depend to a great extent upon the knowledge, skills, attitudes and opportunities of the individual farmer working within the specific conditions of his or her farm, and on the context of national and international socio-political and economic environments (van de Weerd et al., 2009; Oppermann et al., 2008; Tuytens et al., 2008; Cabaret, 2003).

Therefore, cross-talk and interdisciplinary debates about health in agriculture are urgently needed to develop holistic concepts, criteria and methodology for health ‘measurement’. A crucial first step is the clear identification and demonstration of health concepts in organic farming practice. Focussing this approach on testing, monitoring and demonstrating health concepts of successful best practice farmers can lead to a better understanding and communication of health and its impact on the whole food system.

2. Material and methods

2.1 Identifying best practice farms in each project country (addressing objectives A+B)

The first step of this project was to identify which principles, strategies and methods organic farmers have adopted that make them successful in relation to health management on their farms. In each of the three partner countries Austria, Germany and the UK, we have identified five organic best practice farms. With each of these national working groups, we have jointly established what their individual and personal visions, strategies and principles of health are.

The work focused on the three partner countries, which represent various environmental conditions in Europe (e.g. climate, soils), but also various economic conditions (e.g. market share of organic products, land area farmed organically) and cultural/social variations. In each of the three countries, five best practice farms were identified, with whom the later tasks of this project were developed (workshops and guidance material). The five farms should reflect a variety of growing systems (mixed farms, horticulture, arable, dairy etc.); they were not chosen to be representative for each country, but are seen as examples and case studies. The number of participants was held low, to maximise individual involvement and outcomes during the workshops.

The selection of the farmers was a 2-step process, with an initial online survey launched in each country, followed up with interviews and discussions with a variety of external experts familiar with the particular farms (advisors or consultants, representatives of farmer organisations, etc.). This has finally enabled informed decisions on the farm selection; based on statements of the farmers themselves, but also based on feedback from others familiar with the individual systems.

2.1.1 *Online survey of farmers in Austria, Germany and the UK*

An online survey was launched in the beginning of the first project year, which was widely spread in the three partner countries Austria, Germany and the UK. The survey asked farmers to participate and answer questions on how they manage health on their farm, what outputs of their system they believe to be healthy, why they decided to produce organically in the first place and what changes in health they have noticed over the years of running the farm organically. The questions were formulated in German and English, and the respective answers were then, first per language, and then jointly evaluated by the project team (all fluent in both languages). Where translations were unclear or tricky, the team discussed the possible meanings and messages of certain statements in more detail, to ensure a clear comparison of results. The results of the survey can be found in section 3 below.

Based on the various answers of this survey, the project team has extracted and aggregated a list of *statements* from the farmers, which could be potential principles of health. In the different quantitative and qualitative answers, the team searched for patterns, underlying themes and commonalities, based on which it was possible to identify and formulate visions, philosophies and strategies of the farmers. This survey summary and formulation of key-statements over all countries was initially performed by the three project partners Rebecca Paxton, Ralf Bloch and Anja

Vieweger individually, and then merged during a discussion of all project partners to produce a list of *ten health statements*, formulated as strategic suggestions on how to improve health in a farming system. They are presented in full length and further explained in section 3 below.

2.1.2 *Expert interviews and criteria for best practice farmer identification*

To gain more in-depth background information and discuss the first conclusions on potential best practice farmers based on the survey answers, as well as to broaden the scope also to farmers who didn't answer the survey, the project team identified a group of 'experts' in each country, who were asked to support the selection process of best practice farmers and make suggestions based on their experience in working with them.

The experts were given the following short introduction to the project and then asked to suggest potential best practice farmers, of whom they thought would fit very well in the range of criteria further below:

Because one of the key statements of the principles of organic agriculture (IFOAM, 2005) states that 'the health of soil, plant, animal and human is one and indivisible', we are looking for farmers who are aware of such connections and who have managed to consider and improve the health of their system in all these areas. The best practice farmers we are looking for will therefore not be highly successful solely in one particular area, such as for example animal welfare/husbandry, while neglecting another such as their soils. Ideally they will be successfully managing good to excellent health in all of the disciplines. We would like to ask for your help in identifying these five best practice examples in your country. Among your wide contact network of practitioners, growers or farmers, can you make a suggestion of one or more persons who we should get in touch with to collaborate in this matter? Can you nominate a 'best practice example farmer with respect to managing a healthy agricultural system'? Please explain why you think they are best practice examples.

The experts were given a list of criteria, developed by the project team specifically for this task, which the farmers should be 'judged' upon. These criteria should be seen as guidelines, are equally important and optimally should all be fulfilled by the person(s) they suggested.

The selected farmers should:

- **have a clear vision of the health aspects/concepts on their farm** (a clear view of what makes the farm healthy)
- **be aware of the impact of their actions and practices on health** (health effects and outputs of their system)
- **be aware of where there are health deficiencies in the system, and be prepared to improve them continuously**
- **manage a stable level of health on their farm for several years already** (longevity and success of their methods)
- **be open to share their own philosophies with others and be interested in learning from other farmers**

During in-depth interviews with the various experts, as well as follow-up phone calls and visits to some individual farms, the selection was narrowed down to a short-list of farmers. The final selection of the best practice farmers in each country was based on all the information gathered in

the steps above and then finally on their willingness to join the project and their ability to attend both the national and the international workshops.

The selected male and female farmers in each country are shown in the table below.

Table 1: Selected best practice farmers for this project in each country

Germany		Austria		United Kingdom	
	Fridjof Albert, Hof Marienhöhe www.hofmarienhoehe.de		Marion Aigner-Filz, Porrau www.lebendigeracker.at		Richard Gantlett, Yatesbury House Farm yatesbury.webs.com
	Godehard Hanning, Kirchhof www.kirchhof-oberellenbach.de		Martin Hotter, Sankt Veit im Pongau		John Newman, Abbey Home Farm www.theorganicfarmshop.co.uk
	Ina Hoyer + Diana, Bunte Kuh UG www.diebuntekuh.info		Maria Vogt, Obersdorf		John Pawsey, Shimpling Park Farm www.shimplingpark.com
	Manfred Kränzler, Schönberghof www.schoenberghof.de		Fred Zehetner, BOA Farm www.beefcattle.at		Adrian Steele, Chapel Farm
	Johann Pfänder, Pfänder-Hof GbR www.pfaenderhof.de		Christoph Zehrfuchs, Kroisbach www.zehrfuchs.at		Iain Tolhurst, Tolhurst Organic www.tolhurstorganic.co.uk
					Mark Measures, Cow Hall www.organicmeasures.co.uk

Note: For the farmer group in the UK, one additional farmer and advisor was invited, Mark Measures, Director of the Institute for Organic Training and Advice (IOTA); because most of the selected best practice farmers in this country mentioned his name during their in-depth interviews, and that they have learned from him over the years, or were advised by him during their conversion period to organic.

2.2 National workshops with best practice farmers (addressing objectives B, C and D)

During two-day workshops with the identified best practice farmers in Germany, Austria and the UK in autumn 2015, the presentation and comparison of individual health strategies of the farmers aimed to identify possible commonalities and differences in their personal visions or philosophies. The list of *ten health statements* derived from the survey answers was now used as basis for these discussions. The farmers in each country were asked to analyse each statement in detail and decide (1) whether they can agree or not, (2) wish to adapt certain sections, (3) change specific wording, (4) discard the statement entirely or (5) add a completely new one to the list. In the following, impressions of the three national workshops are shown, in order of the date of the events.

The workshops were organised by the local project partners Rebecca Paxton (AT), Ralf Bloch (DE) and Anja Vieweger (UK); Anja Vieweger travelled to all three locations to facilitate the workshops, and to ensure continuity and as similar preconditions for the discussions as possible for the comparability of outcomes.

All discussions during workshops were recorded, to enable an in-depth qualitative analysis of the outcomes later. The outcomes of the discussions during these national workshops and the identified commonalities and differences between farmers and countries are shown in sections 3 below. An example agenda of the UK workshop can be found in annex A.

Austria

The first workshop was held in Austria, on 12th and 13th November 2015; and was hosted by Fred and Dani Zehetner, BOA Farm, one of the five best practice farms selected in Austria. All five selected Austrian farmers attended, as well as Anja Vieweger and Rebecca Paxton from the project team for workshop organisation and facilitation.



Figure 1: Photos of the best practice farmer workshop in Austria, at BOA Farm, 12 + 13 November 2015

Germany

The second workshop was held in Germany, on the 16th and 17th November 2015; hosted by one of the German best practice farms, Godehard Hanning, Kirchhof. All five selected German farmers attended, as well as Anja Vieweger, Ralf Bloch and Johannes Bachinger from the project team for workshop organisation and facilitation.



Figure 2: Photos of the best practice farmer workshop in Germany, at Kirchhof, 16 + 17 November 2015

United Kingdom

The third workshop was held in the UK, on the 26th and 27th November 2015; hosted by one of the British best practice farms, John Newman, Abbey Home Farm. All six selected British farmers attended, as well as Anja Vieweger and Lawrence Woodward from the project team for workshop organisation and facilitation.



Figure 3: Photos of the best practice farmer workshop UK, Abbey Home Farm, 26 + 27 November 2015

2.3 International workshop with best practice farmers (addressing objectives C+D)

The international workshop was organised in Frankfurt, Germany, on the 22nd and 23rd February 2016. This workshop brought together the three national working groups of best practice farmers, to jointly evaluate the outcomes gathered during the national meetings. All six farmers from the UK were able to attend this workshop, as well as four of the five Austrian, and three of the five German farmers; as well as Anja Vieweger, Thomas Döring, Milena Klimek and Ralf Bloch from the project team. During this workshop, the groups assessed if there were commonalities in their visions, philosophies and strategies for making their farming system healthy; but also, if and which of their own, personal principles of health could potentially be transferred to other farmers, or to farmers in different countries. The main output of this meeting was a list of *ten health statements of farmers*, developed and agreed by the international farmer group of the project. This list provides the base for the guideline “Towards Farmer Principles of Health” developed as output of this project. The agenda of this workshop is shown in annex B.



Figure 4: Photos of the international farmer workshop in Frankfurt, Germany, 22 + 23 February 2016

2.4 Workshop with interdisciplinary, scientific experts (addressing objective E)

On 19th and 20th September 2016, the last project workshop was organised at the Leibniz Centre for Agricultural Landscape Research (ZALF), Müncheberg, Germany. For this meeting, the project team has invited researchers and scientists from a wide range of disciplines to encourage the communication among different scientific disciplines of health research. During the workshop, the *ten health statements* of farmers, including their development process were presented and discussed with the ‘new audience’. The statements were evaluated in light of new and extended perspectives and scope of the entire food chain based on the different disciplines present. The group then jointly identified needs for clarification, relevant research questions and collaboration opportunities and developed new project ideas and consortia. This workshop provided the basis for future research collaboration and networking, guided by an interdisciplinary approach to health research in agricultural systems. The outcomes of this event, as well as an initial list of new project ideas and research needs developed during this workshop is shown in section 3 below.

As part of this workshop, a farm walk was organised at the Farm Marienhöhe. It is the oldest biodynamic farm in Germany, established in 1928 to demonstrate that the methods described in Rudolf Steiner’s lectures of 1924 also work in the soils of this area in Germany. The farm walk was hosted by one of the project’s best practice farmers, Fridjof Albert; it enabled a practical hands-on view of health principles on this specific farm, which stimulated a rich discussion concerning health among all participants.

The agenda of this event can be seen in annex C.

The list of participants of this international workshop is shown in the table below.

Table 2: List of participants of international workshop with best practice farmers and scientists

	Last name	First name	Address	Website
1	Bachinger	Johann	Leibniz Centre for Agricultural Landscape Research, Germany	www.zalf.de
2	Barberi*	Paolo	University of Pisa, Italy	www.sssup.it
3	Bloch	Ralf	Leibniz Centre for Agricultural Landscape Research, Germany	www.zalf.de
4	Brock	Christopher	Research Association for Biodynamic Agriculture, Germany	www.forschungsring.de
5	Cabaret	Jacques	French National Institute for Agricultural Research, France	www.inra.fr
6	Döring	Thomas	Humboldt University Berlin, Germany	www.hu-berlin.de
7	Hanning	Godehard	Kirchhof, Germany	www.kirchhof-oberellenbach.de
8	Klimek	Milena	Universität für Bodenkultur Wien, Austria	www.boku.ac.at
9	Newman	John	Abbey Home Farm, UK	www.theorganicfarmshop.co.uk
10	Ruelke	Diana	Hof zur bunten Kuh, Germany	www.diebuntekuh.info
11	Smith	Barbara	Coventry University, UK	www.coventry.ac.uk
12	Jensen*	Erik Steen	Swedish University of Agricultural Sciences, Sweden	www.slu.se
13	Stopes	Christopher	IFOAM EU/EcoS Consultancy Ltd., UK	www.ifoam-eu.org
14	Strassner	Carola	University for Applied Sciences Münster, Germany	www.fh-muenster.de
15	Vieweger	Anja	The Organic Research Centre, UK	www.organicresearchcentre.com
16	Watson	Christine	Scotland's Rural College, SRUC, UK	www.sruc.ac.uk
17	Wolfe	Martin	Wakelyns Agroforestry, UK	wakelyns.co.uk
18	Woodward	Lawrence	The Organic Research Centre, UK	www.organicresearchcentre.com
19	Zehrfuchs	Christoph	Biohof Zehrfuchs, Germany	www.zehrfuchs.at

*attended via Skype



Figure 5: Photos of the international workshop with scientists at ZALF, Germany, 19 + 20 September 2016

2.5 Development of a practice guideline (addressing objective F)

One of the main direct outputs of this project is a guidance note/brochure of the *ten health statements* developed by the farmers, for the practical implementation of the project findings. The document was produced in close collaboration with the farmers and advisors involved in this project, to ensure the relevance and applicability of these strategic methods in practice.

The document represents the result of the group effort of farmers, who jointly developed and agreed upon the formulation of the statements. The brochure is seen as a working document and the ten statements of health now need to be tested and validated by a larger, international group of practitioners as part of a follow-up project. See further discussion of this document in section 4 below, and an online version will be downloadable under <http://tinyurl.com/HealthNetworks>.

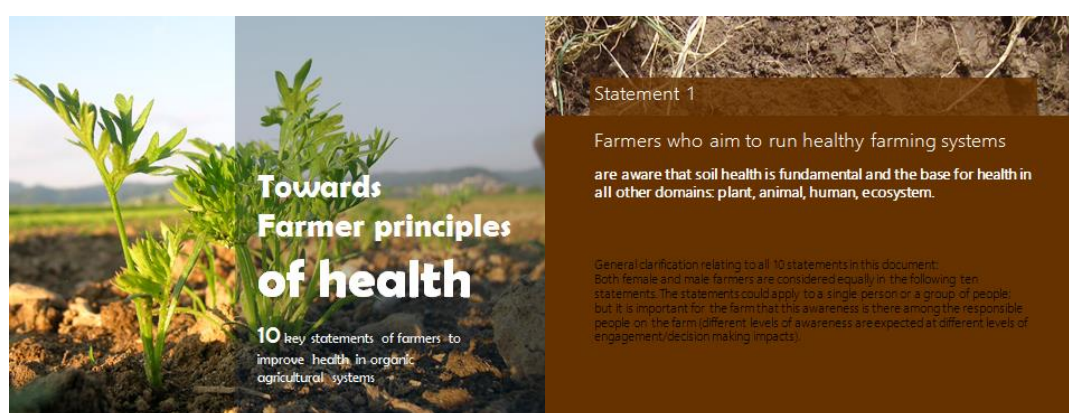


Figure 6: Title and first page of the newly developed brochure “Towards Farmer Principles of Health”

3. Results

3.1 Online survey

In total, 79 farmers took part in the international online survey: 30 answered the English survey and 49 the German one. (They were not required to leave their name and address, only if they were interested in being contacted and further taking part in the project; not allowing the identification of exact numbers in each German speaking country). The full questionnaire in English can be found in annex D.

When comparing the answers from the three countries, we found a lot of similarities with regards to **reasons, or ‘key events’, which made the farmers and growers decide to produce organically**. Health-related reasons for organic conversion were dominant in all countries: ‘Not having to spray pesticides myself’; ‘Not using chemicals is very important to us, so we and our children can eat what we grow without second thoughts’; ‘My grandchildren should be able to run around freely on my farm!'; ‘My daughter’s disease improved dramatically since we converted’; etc. However, there was also a strong trend of responses to be focussed also on environmental and ecosystem reasons:

‘For the health of the environment’; ‘Sustainability’; ‘To keep my soil and all organisms healthy’; ‘Read silent spring when I was younger’; etc.

The question, **how they have noticed the health of their system change over time**, was split into four time periods: after 2-5 years, after 10, 15, 20 and more years. A qualitative text analysis of this open question showed the following key words were mentioned most frequently by the 79 participants, illustrated in the four graphs below. The results revealed that in all four time periods, an increase in biodiversity, soil health, as well as a significant reduction of antibiotic treatments needed for livestock where the most apparent changes of health for farmers. Particularly interesting was that these changes were noticed already after only a few years of organic production, and remained the most important points throughout the following years. Another interesting result is that the farmers who answered the survey found only a very slight decrease in yield during the first couple of years (2 farmers); and after that, the increase in yield was mentioned by a lot more participants (5-6 farmers in each time period). And ultimately, the improvement of human health was stated frequently throughout all four time periods; a decline in human health, stated in the first time period, was explained with higher stress levels of farm workers during the conversion period.

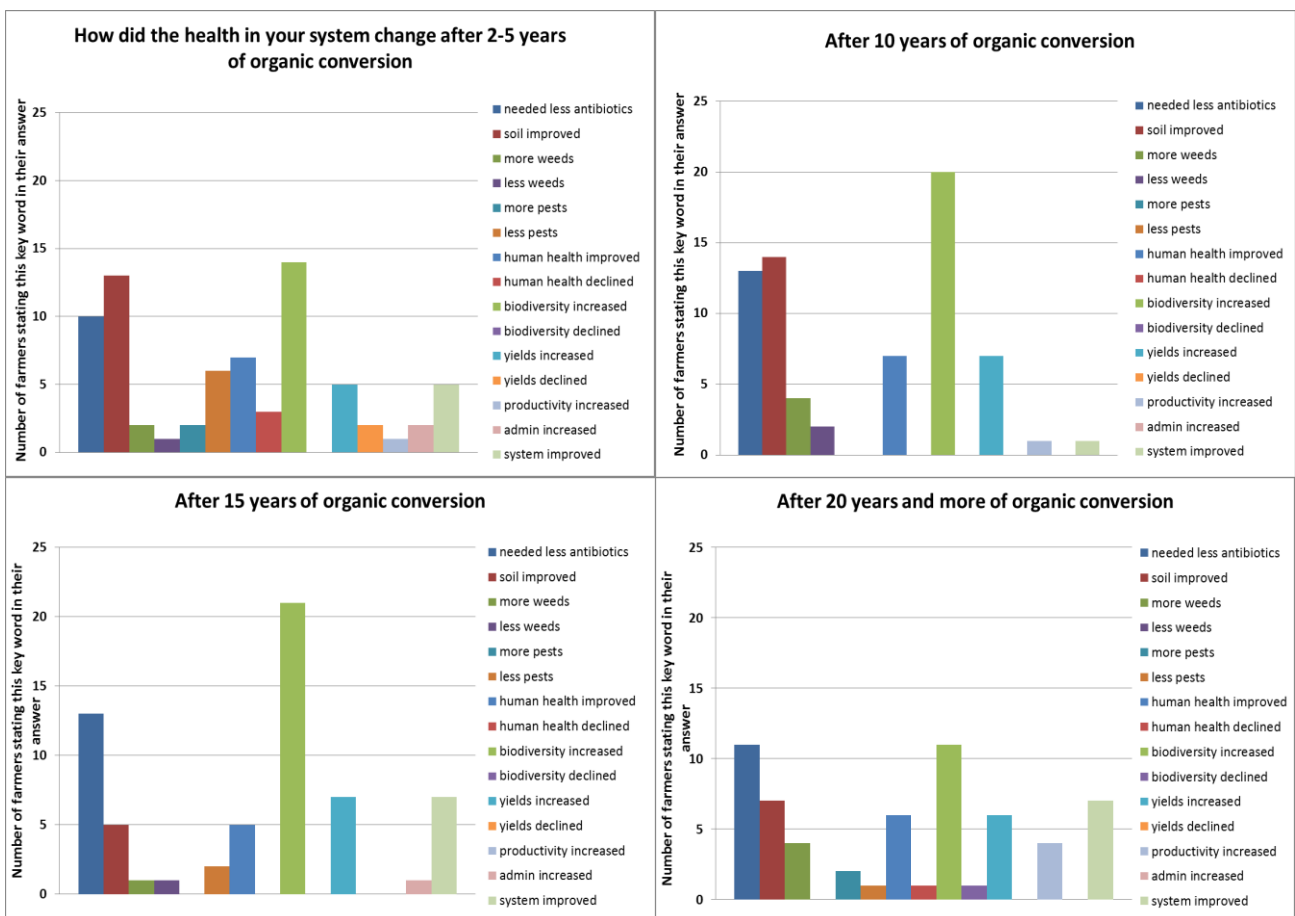


Figure 7: How farmers/growers from the survey perceived health changes in their system over the years since conversion. (The graphs show total numbers of answers, which are spread as follows: 20 respondents farmed organically for 2-9 years, 9 respondents for 10-14 years, 12 respondents for 15-19 years and 35 respondents for longer than 20 years (maximum was 40 years).

The survey participants were also asked to describe **how they made their farm healthier over the years**, what methods or strategies they have used to improve and increase the health of their system. A high percentage of respondents to this question from all three countries highlighted the importance of soil fertility, soil life and soil organic matter. As already seen in the results above, soil health was one of the first changes of health on the farm perceived by the farmers after conversion to organic farming; and also in this question, many respondents described their strategy to improve the health of the soil, in order to achieve plant and animal health. Another very important strategy of the survey respondents to improve health on their farm was to increase diversity/biodiversity; one farmer even stated in a follow-up interview that “he grows biodiversity on his holding, and most of his actions aim to increase biodiversity, the vegetables are just a side-product!” The figure below shows the responses to this question with regards to those two most apparent strategies.

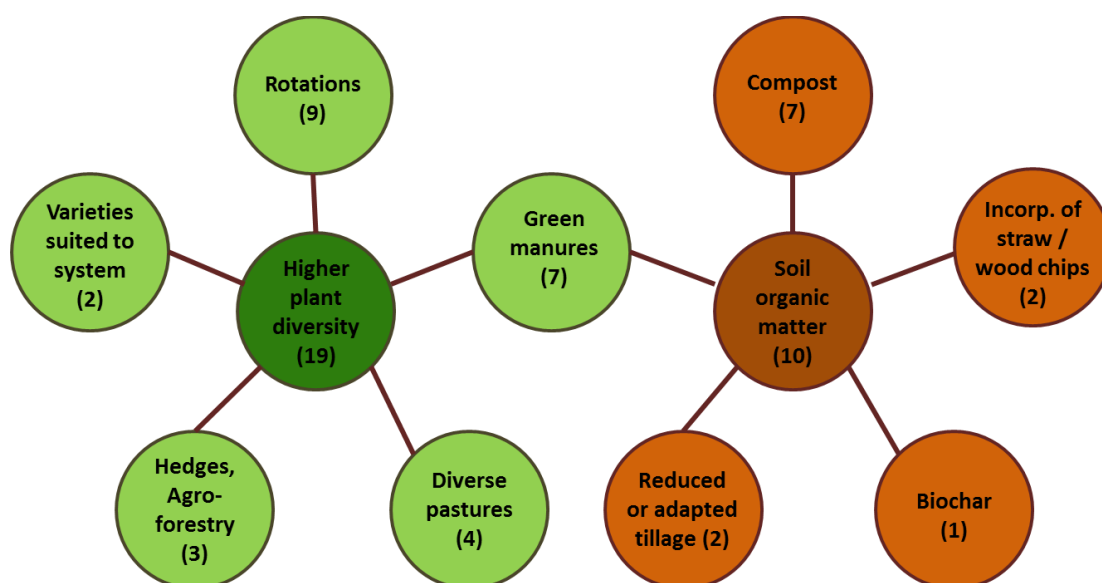


Figure 2: Farmers in the survey were asked to describe HOW they made their farm healthier over the years, and which methods or strategies they have used. (The numbers in brackets show the number of respondents out of 28; post-hoc classification, after Döring et al., 2015).

3.2 General impressions from national workshops with best practice farmers

As part of the analysis of discussions during the national workshops, we have produced an overview of farmer statements in relation to the five disciplines: soil (orange), plant (green), animal (red), human (blue: dark blue is directed at the ‘inside’, farmer, farmer family, responsible person; and light blue is directed towards the ‘outside’, e.g. customers, consumers etc.), and ecosystem or farm system (purple), and examples of how they could be linked to each other. The following figures show the individual discussion points of the three country workshops, describing also those statements that were not used directly in the final list of *10 health statements* (see next sections below), but have contributed to their development and final wording/formulation.

United Kingdom

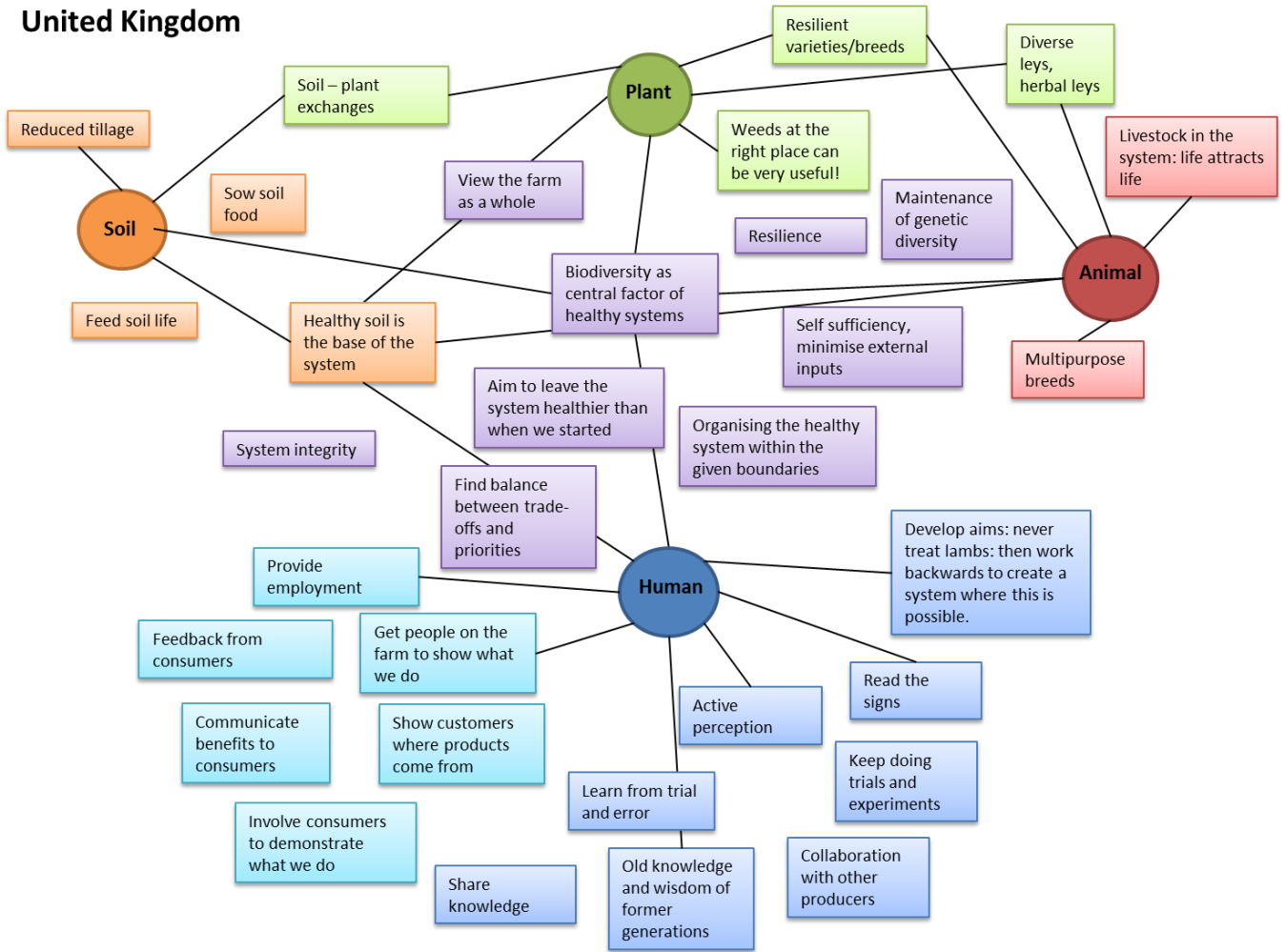


Figure 8: Overview of different key-words and statements related to health in agricultural systems made by the farmers during the national workshop in the UK

Austria

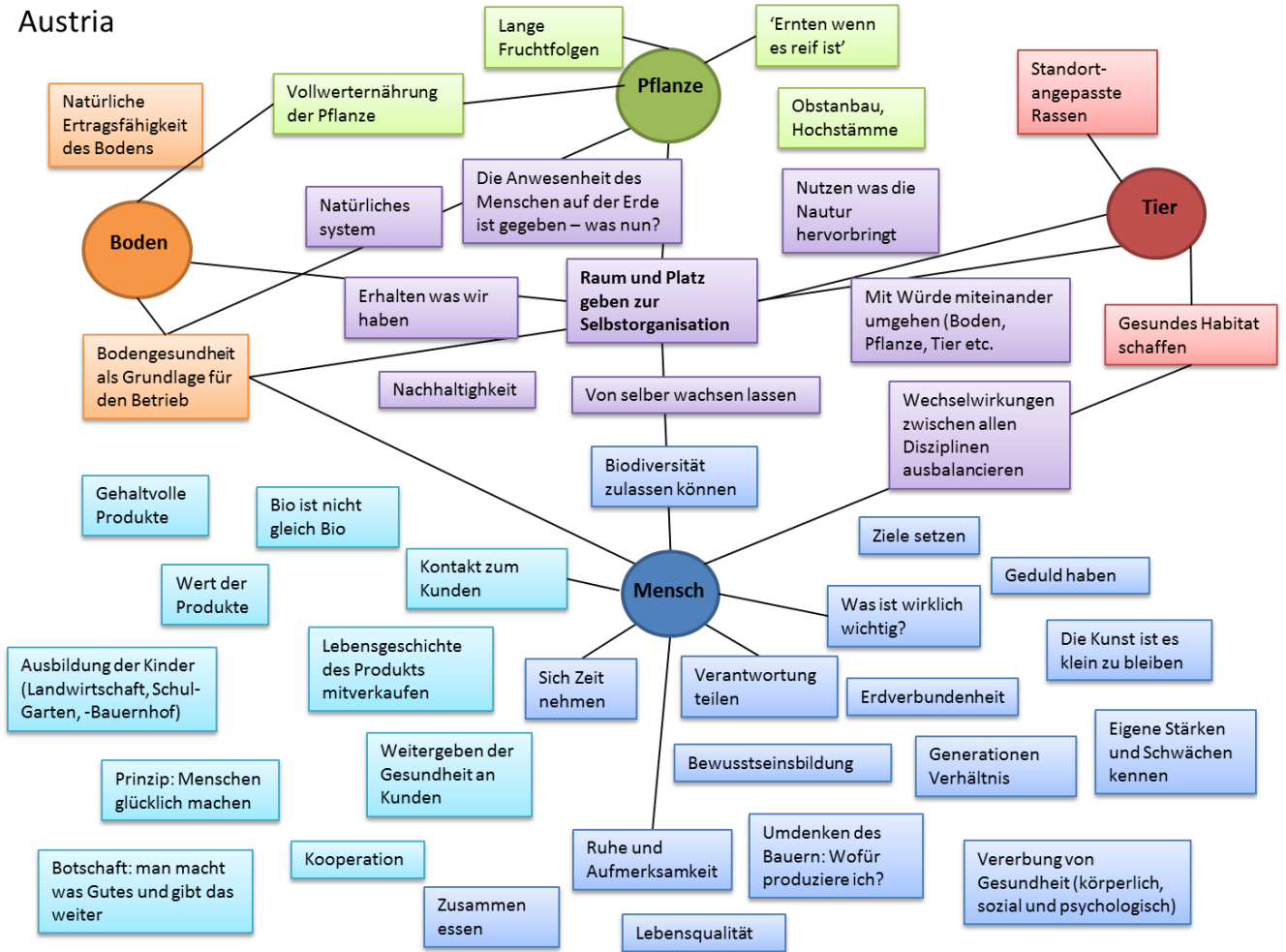
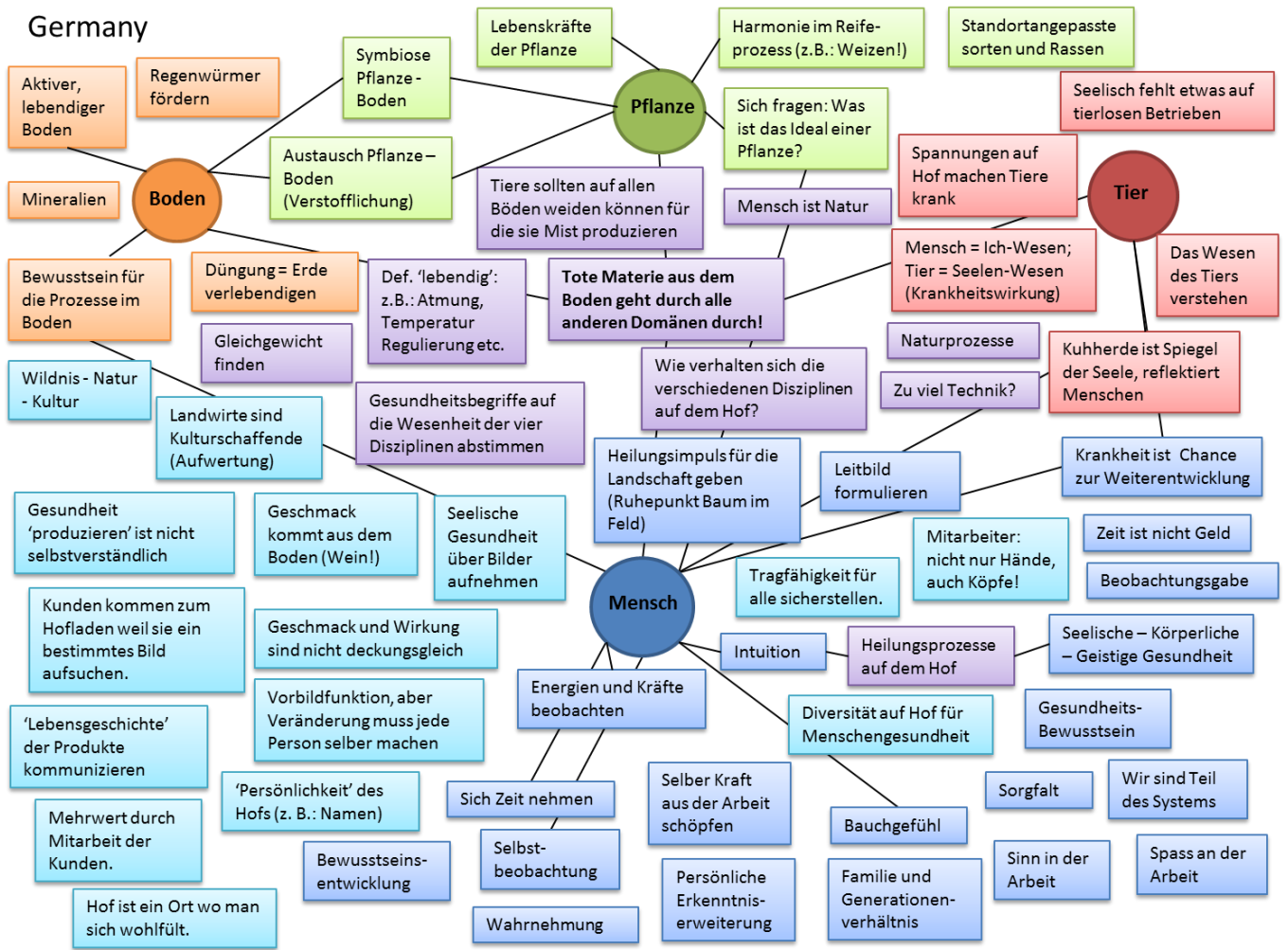


Figure 9: Overview of different key-words and statements related to health in agricultural systems made by the farmers during the national workshop in Austria



3.3 Statement development

In this section the evolution of each statement is presented. We begin with the first suggested formulations, derived from the international **survey**, and describe how they were further refined by the farmers during the **national workshops**. The changes made to the statements at each national workshop were presented and discussed at the **international workshop**, where all three farmer groups came together. During this workshop, the farmers from all countries agreed upon the final set of shared statements. Minor changes to enhance the clarity and understanding of the statements were suggested by off-farm professionals at the **final international workshop** and are also presented in this section. However, these minor changes were not included in the final output of the **guidance brochure**, as it was seen as important (by the project team and by the farmers) to keep this set of statements as they were formulated and agreed by the farmers (ownership lies with the farmers) and in their own 'language'.

The list below shows the list of statements as they were derived and condensed by the project team from the online survey results, which was used as basis for the discussions during the national workshops with farmers.

- 1) Farmers who run healthy farming systems are aware that **soil health is most important** and the base for health in all (many) other domains: plant/animal/human/farm/products.
- 2) Farmers who run healthy farming systems **closely observe changes in biodiversity** on their farm (particularly earthworms, farmland birds, bees and beneficial insects) and aim for high and increasing biodiversity in their system.
- 3) Farmers who run healthy farming systems are aware of working in a natural system and feel that **best health is achieved when all domains are part of the system**: soil, plants, animals and humans (livestock <-> stockless).
- 4) Farmers who run healthy farming systems have a **well-developed ability to closely observe key health-related processes** on their farm, have a good overview of the system.
- 5) Healthy farms are **small-scale** farms, and / or are **able to organise the capacities** of the farm to face the complexity of the system. Large-scale farms may require different processes and organisational structures to achieve health.
- 6) The main aims of farmers who run healthy farming systems **shift away from productivity**, top-performance breeds and high yields towards other qualities like biodiversity and animal welfare: stability rather than growth.
- 7) Farmers who have been certified organic for longer (i.e. more than 10 years) tend to shift their focus from improving health in annual growing cycles towards a broader view of the system; improving health by incorporating **more long-term structures** on their farm (structural changes like e.g. perennials, habitats, hedges, trees etc.).
- 8) From the perspective of farmers who run healthy farming systems, **the first and most apparent indicators** (both positive and negative) **of health on the farm** are: soil fertility and changing difficulty of working the soil, increasing biodiversity, improvements of the health of people on the farm (stress and injuries), increasing yields, number of veterinarian visits, number of antibiotics/wormer/medicine uses, reduction of external inputs.
- 9) Farmers see their **main mechanism to contribute to human health** is through their high quality products (food) indicated by consumers, and are much less aware of other areas (e.g. public goods, environment etc.).
- 10) Farmers are **insufficiently equipped with tools and methods** to assess and measure their health contribution in other aspects of their system's outputs (e.g. public goods, environment etc.).

3.3.1 National workshops

First, the statements and discussions from each national workshop are presented in the order in which the workshops took place: Austria, Germany and United Kingdom. The formulation of each statement as it appeared pre- and post-national workshop are shown in a table for each statement, labelled "Original" and "Final" respectively. Each table is followed by a brief narrative summary of the farmers' discussion of the statement. Two new statements were developed at the Austrian and German workshops and these are added as "Statement 1 Final AT" and "Statement 1 Final DEU" below. Concluding the description of each national workshop is a reflection upon the workshop process including lessons learned.

Austrian National Workshop

Statement 1

No original (new statement)	Final AT
	Bauern und Bäuerinnen, welche gesunde landwirtschaftliche Systeme bewirtschaften, sind sich der eigenen Stärken und Schwächen bewusst und kennen ihre eigenen Reserven und die des Betriebes (Sozialer Halt und Netzwerk, Urvertrauen etc.).

This statement was added at the end of the statement discussions. The importance of a farmer to understand their current situation including their strengths and weaknesses as a farmer and within their farm system was discussed at length and within many of the other statements. This awareness of the strengths, the resilience, and the necessity to both help and receive help from a farmer's community was seen as highly relevant to the health of the farmers' systems. Self-confidence and awareness was discussed as being part of this, as well as trusting your personal skills but also your social network. The importance of learning how to observe in general, and observe these strengths and weaknesses, was also stated as being essential in order to understand and achieve the rest of the statement. A farmer's personal character was seen as influential in this. A farmer must be open enough to either see, or learn how to see, the beauty or enjoy the small things that one can observe within their farm and their social and personal lives.

Additionally, one farmer raised the concern to the group (both at the Austrian workshop and subsequently at the international workshop) with the German term *Landwirte* for 'farmers'. She strongly suggested replacing the term with *Bäuerinnen und Bauern* because it explicitly addresses both male and female farmers, and does not only 'imply' both genders; and because she feels more 'spoken to' with the term *Bäuerin*, instead of *Landwirtin*. At the international workshop these terms were discussed with all farmers, who agreed and accepted the use from then onwards.

Statement 2

Original AT	Final AT
Landwirte, welche gesunde landwirtschaftliche Systeme bewirtschaften, sind sich der Wichtigkeit von Bodengesundheit als Kernpunkt und Basis für die Gesundheit in allen (vielen) anderen Bereichen (z.B.: Pflanze, Tier und Mensch) bewusst.	Bauern und Bäuerinnen, welche gesunde landwirtschaftliche Systeme bewirtschaften, sind sich der Wichtigkeit von Bodengesundheit als Kernpunkt und Basis für die Gesundheit in allen (vielen) anderen Bereichen (z.B.: Pflanze, Tier und Mensch) bewusst.

Soil health, as the foundation of farm system health, was wholeheartedly agreed upon among all farmers. A very interesting discussion concerning a different scale of possibility for mistreatment of the soil also followed suit. It was debated that soil health is perhaps easiest to achieve when you have a forest, easier if you have pastures (for animals, etc.), and more difficult to achieve when you are actively disturbing the ground with cash crops and vegetables and adding a lot of inputs. It was also stated that perhaps when using the land more intensively, there is a higher possibility (risk) to

make mistakes or to overlook something that is relevant. However, in the end the statement was not changed to reflect this gradation.

Additionally, the use of anthroposophical perspectives as a way to avoid monocultures, to gain deeper insights in natural cycles and understanding nature’s way with biodiversity was discussed as being beneficial when thinking about soil and farm system health. One question was raised: How do we preserve creation, but in a human-friendly way? This was a reaction to the importance of working with nature or using nature as an example, and to the common environmental statement that the natural system would be better off if humans were not present. One farmer stated (translated): *“We can’t get anywhere with this perspective”* (it is not something we can change) and therefore need new ways of thinking, such as working with nature. This may have less to do with soils and more to do with the fact that this was the original first statement discussed and some introduction or space was needed to switch to thinking about farm system health.

Statement 3

Original AT	Final AT
Landwirte, welche gesunde landwirtschaftliche Systeme bewirtschaften, beobachten und verfolgen Veränderungen in der Biodiversität auf ihrem Hof ganz genau (speziell Regenwürmer, Brutvögel, Bienen und Nützlinge); und arbeiten kontinuierlich an einer Steigerung und Verbesserung der Biodiversität in ihrem System.	Bauern und Bäuerinnen, welche gesunde landwirtschaftliche Systeme bewirtschaften, beobachten und verfolgen Veränderungen in der Biodiversität auf ihrem Hof ganz genau (speziell Regenwürmer, Brutvögel, Bienen und Nützlinge); und arbeiten kontinuierlich an einer Steigerung und Verbesserung der Biodiversität. <i>(Ruhe halten und beobachten, geschehen lassen, der Natur den Raum geben zur selbst-organisation!).</i>

The discussions around this statement included plenty of examples of what farmers do to increase biodiversity, observation, not getting involved when it isn’t necessary, nature itself is incredibly diverse and to allow it the space to be diverse and self-organise. The farmers stated that (translated) *the balance that nature provides through biodiversity is what makes a system healthy*. Additionally, discussion revolved around subsidies for incorporating more biodiversity. Particularly interesting to the farmers was if farmers who partake in such subsidies actually understand what increasing biodiversity means, what it stands for or if they are only signed up for subsidies because of economic reasons. This point was not only applied for organic farming. However, when subsidies were left out of the question, the farmers agreed to this statement of biodiversity.

Statement 4

Original AT	Final AT
Landwirte, welche gesunde landwirtschaftliche Systeme bewirtschaften, sind sich bewusst dass sie in (und mit) einem natürlichen System arbeiten; und sind der Meinung dass die höchste Gesundheit erreicht werden kann, wenn alle Domänen im Hof einbezogen sind: Boden, Pflanzen, Tiere und Menschen.	Bauern und Bäuerinnen, welche gesunde landwirtschaftliche Systeme bewirtschaften, sind sich bewusst dass sie in (und mit) einem natürlichen System arbeiten; und sind der Meinung dass die höchste Gesundheit erreicht werden kann, wenn alle Domänen im Hof einbezogen sind: Boden, Pflanzen, Tiere und

	Menschen (Größen-abhängig!).
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All farmers agreed upon the overall meaning of this statement. There was a point of concern regarding the intensity of use of one domain over another within a farming system. The type of management was stated as important when integrating domesticated animals into the system in terms of how many animals, how intense or the amount of animals used. Also intensity in vegetable production and the importance of managing crop rotation was discussed as key. Finally, how large a farm can be without domesticated animals (solely with wild animals, pollinators, etc.) was found to be an important component of this statement. A rule of thumb was given as good way to achieve balance throughout the domains: *regardless if a farm has animals or not, and regardless of size, 20-30% of it should be in a period of rest each year.* However, this was not transferred and reflected in the statement itself. But one note was added to the statement: that concerning the health of a farming system, including all domains is entirely dependent on the size of the farm, or the size of the different domains in proportion to the overall size of the farm.

Statement 5

Original AT	Final AT
Landwirte, welche gesunde landwirtschaftliche Systeme bewirtschaften, haben die gut ausgebildete Fähigkeit um Schlüsselprozesse der Gesundheit auf ihrem Hof ganz genau zu beobachten, und haben einen guten Überblick über das System.	Bauern und Bäuerinnen, welche gesunde landwirtschaftliche Systeme bewirtschaften, haben die gut ausgebildete Fähigkeit um Schlüsselprozesse der Gesundheit auf ihrem Hof ganz genau zu beobachten, und haben einen guten Überblick über das System.

Although this statement was left unchanged, there was a discussion about in addition to needing the skills to observe the key processes of farm health, one also needed to have the skills to deal with social and logistical pressures. This refers to the ability to really listen and react to the subconscious saying that something is not okay, but often because of logistics or social pressure a farmer feels as if they cannot react.

One farmer responded to this with (translated): *“I think it is important to have the independence that allows me the space and freedom to try things. I try something because I want to and if something bad happens or it doesn’t work out, no big deal, it wasn’t a huge risk. But if I have debt or the situation is strained somehow, the farmer doesn’t have this opportunity. But it is necessary to have this room.”*

The key processes to know if a farm is healthy were identified as fertility, with plants and animals, such as the amount of calves a cow births; or knowing that a certain process or action simply works, perhaps leading to the idea of intuition. The simplicity of this knowledge was paralleled to thinking like a child: *“It is important to think like a child.”*

Statement 6

Original AT	Final AT
Landwirte, welche gesunde landwirtschaftliche Systeme bewirtschaften, bewirtschaften einen kleineren Familienbetrieb, und/oder haben die	Bauern und Bäuerinnen, welche gesunde landwirtschaftliche Systeme bewirtschaften, bewirtschaften einen kleineren Familienbetrieb,

Fähigkeit um die Kapazitäten auf dem Hof optimal zu organisieren um die komplexen Herausforderungen und spezifischen Anforderungen für gute Gesundheit auf größeren Betrieben zu meistern.	und/oder haben die Fähigkeit um die Kapazitäten auf dem Hof optimal zu organisieren um die komplexen Herausforderungen und spezifischen Anforderungen für gute Gesundheit auf größeren Betrieben zu meistern.
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Also this statement was agreed upon and not changed. However, there was a lengthy discussion concerning what types of skills or capacities are necessary to organise or be able to handle the complexity and the specific challenges of a healthy farm. In the end, the farmers expressed indifference to the size of a farm, as long as it is possible to keep a holistic view of the whole farm. One farmer stated (translated): *“There are people that want a large farm, and there are others that don’t want anything to do with a large farm.”*

The importance of knowing what is going on and when something is needed on a farm was highlighted. Having a structured system to make sure this could be achieved is key, one farmer added (translated): *“So that I know tomorrow I have to do this, or that I know tomorrow my employee needs to do that [...] The difference for larger farms is just that it has to be really well organised.”*

Although it was stated that generally the larger the farm the more industrialised, the more tractors and inputs are needed and purchased, rather than produced on the farm; it was decided that when all of these ten health statements are followed, that size doesn’t matter. If a large farm follows the ten statements, then it is healthy. The participants all decided they are all smaller farmers and personally identify with smaller structures, but they can understand how a large farm can be healthy too.

Additionally, there was a detailed discussion about family and having children on the farm; what they ‘bring’ to the farm and how they (necessarily) change attitudes and organisational structures in the system. Therefore family farms were left in the statement.

Statement 7

Original AT	Final AT
Das Hauptziel von Landwirten, welche gesunde landwirtschaftliche Systeme bewirtschaften, ist verlagert, weg von Produktivität (z.B.: Hochleistungsrassen und Sorten), hin zu anderen Qualitäten wie Biodiversität oder artgerechte Tierhaltung: Stabilität anstelle von Wachstum/Produktivität.	Das Hauptziel von Bauern und Bäuerinnen, welche gesunde landwirtschaftliche Systeme bewirtschaften, verlagert sich weg von Produktivität (z.B.: Fokus nur auf höheren Erträgen (kg), Hochleistungsrassen/-sorten etc.), hin zu anderen Werten wie Inhaltsstoffe der Lebensmittel oder artgerechte Tierhaltung.

In this statement, the Austrian farmers sought out a different word for *quality*, and one alternative for them was *value*. The farmers decided that the real question was what kind of value they wanted to give onwards? The group decided their value was to move away from mass production. The idea of moving away from the production of larger masses or quantities, and not necessarily away from productivity, was reflected in the new statement and described in parentheses.

The farmers also decided that productivity could be measured through other ways than just kilograms or the amount of products they can yield. This spawned a discussion about the common fallacy that organic farming often gets criticised with not producing enough, and that this sentiment is focused on materials or perhaps a particular product and one farmer stated (translated): *“I think we are very productive in thought and productive in diversity.”*

It was also discussed that the relationship between the farmer and the regulators and places where farmers obtain some of their resources needs to be improved, so that the regulators and extension workers can handle the use of rare or heritage breeds, or heirloom crops. There is a gap in knowledge between the farmers that use these and the institutions that regulate and inform, and this might affect the idea of what is produced on an organic farm.

Statement 8

Original AT	Final AT
Landwirte, welches schon länger (mehr als 10 Jahre) nach ökologischen Richtlinien arbeiten, neigen dazu, ihren Schwerpunkt der Verbesserung der Gesundheit von einjährigen Kreisläufen zu einer weiteren Sichtweise des Systems zu verlagern. Zum Beispiel mit der Verbesserung der Gesundheit durch das Einbauen von langjährigen Strukturen auf ihrem Hof (z.B.: Mehrjährige Kulturen, Habitate für Wildtiere, Hecken, Hochstamm Bäume etc.).	Bauern und Bäuerinnen, welche schon längere Zeit nach ökologischen Richtlinien arbeiten, neigen dazu, ihren Schwerpunkt der Verbesserung der Gesundheit von kurzfristiger/einjähriger Planung zu einer weiteren/langfristigen Sichtweise des Systems zu verlagern. Zum Beispiel mit der Verbesserung der Gesundheit durch das Einbauen von langjährigen Strukturen auf ihrem Hof (z.B.: Mehrjährige Kulturen, Habitate für Wildtiere, Hecken, Hochstamm Bäume etc.).

The changes in this statement were drawn from the experience of one young farmer in the group, who took over his family farm in the last 5 years (when this was recorded). He shared with the group that he doesn't have the long-term experience mentioned in the original statement, and he doesn't trust himself to make some long-term decisions. He gave an example of his organic orchard, which he cannot run successfully at this point without the use of copper and sulphur. The amount of time and money that needs to be invested to reduce, or completely avoid these inputs is something he does not have at the moment. But it is definitely a theme that he thinks about for the future. The more experienced farmers showed him though that he might not have the resources to make the necessary changes for his long-term plans at this stage, but that he is actually already thinking for the long-term. Thus, it was decided that younger farmers and new entrants should at least think about the long-term, even if they cannot afford it right away; they should develop the ideas, be aware, and implement when possible, or have it as a goal. One farmer added (translated): *“It is about not losing the overall goal.”* This was reflected in changing the ‘more than 10 years’ of experience.

Statement 9

Original AT	Final AT
Landwirte sehen den Hauptmechanismus, wie sie der menschlichen Gesundheit beitragen	Bauern und Bäuerinnen, welche gesunde landwirtschaftliche Systeme bewirtschaften,

können, in ihren qualitativ hochstehenden Produkten (Nahrungsmittel); sie sind sich jedoch viel weniger bewusst, dass sie auch in anderen Bereichen wichtige Beiträge leisten (z.B.: durch die Schonung der Umwelt, öffentliche Güter etc.)	brauchen eine Ent-Konditionierung ihres ‚Am Markt Denkens‘; die Lebensgeschichte der Produkte muss mit-verkauft werden (z.B.: Kulturlandschaft).
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The Austrian farmers had a problem with the terminology of ‚Hauptmechanismus‘. Therefore they discussed what they saw as the background problem that this statement addresses, one farmer stated (translated): *“I think that the majority of consumers see the product, or the organic advertisement that shows them the product; but it is the life-story what really makes the product, and this is often not shown in this sense.”* The farmers share the opinion that the environment and circumstances of how the food products were produced are what counts and they didn’t agree with the original statement 9. The competition on the market and with conventional prices, and the whole production process of the product, its life-story, needs to be included in the purchase (also explaining the price). Thus the statement was changed to the necessity of deconditioning ‘market thinking’ of consumers and including the life-story within a product. The importance of including culture and cultural landscapes within this life-story of a product was also seen crucial.

Statement 10

Original AT	Final AT
Landwirten stehen wenige geeignete Werkzeuge oder Methoden zur Verfügung um den Gesundheitsbeitrag des Hofes als gesamten Systems, oder weitere ‚Outputs‘ ihres landwirtschaftlichen Systems zu bewerten oder zu messen.	Bauern und Bäuerinnen brauchen geeignete Werkzeuge oder Methoden um den Gesundheitsbeitrag des Hofes als gesamtes System, oder weitere ‚Outputs‘ ihres landwirtschaftlichen Systems zu bewerten oder zu messen.

This statement in its original form brought up frustration. The constant measuring and methods towards achieving different goals was seen as being linked to the many attempts of standardisation or certification of one thing or another. The farmers expressed annoyance towards this because they are inundated with this approach, and there is always a risk that their work, organic lifestyle and products are reduced to a few criteria created by others. There was a split in thinking of the farmers here from: the wish that people would get together with likeminded people and work on what is important for them. This could be a solution to the fact that each person has a different idea of what ‘organic’ is. If this communal act would happen, such tools and standardisation would not be necessary. Yet as a rebuttal, the question of a democratic process was poised to these groups of like-mind people idea. In the end, the community solution concept was decided upon as being a really long-term goal that probably won’t be in this lifetime. Yet, the goal would be to connect people so that they feel responsible and ‘related’ and make decisions democratically. Other methods that the farmers stated to have experimented with are perspectives from the food sovereignty movement, to understand health and measure health or obtain methods towards health.

Finally, the question of land ownership was discussed. Farming systems were generally decided to be healthy, or healthiest, if the land is owned by the farmer, instead of rented.

Additionally collected advice

Original AT	Final AT
<p>Aus der Sicht der Landwirte, die ersten und sichtbarsten Indikatoren von Gesundheit (positiv und negativ) auf dem Hof sind:</p> <ul style="list-style-type: none"> - Bessere Bodenfruchtbarkeit und Boden-„bearbeitbarkeit“, - höhere Biodiversität, - verbesserte Gesundheit der Menschen auf dem Hof (z.B.: weniger Stress, Verletzungen etc.), - höhere Ernten, - geringere Anzahl der Tierarzt Besuche, - geringere Anzahl von Antibiotika/Entwurmungs-Behandlungen, - Reduktion der externen Einträge 	<p>The first and most apparent indicators of health on the farm are: Die ersten und sichtbarsten Indikatoren von Gesundheit auf dem Hof:</p> <ul style="list-style-type: none"> - Bodenfruchtbarkeit - Boden-bearbeitbarkeit - Biodiversität - Gesundheit der Menschen auf dem Hof - Ernte - Anzahl der Tierarzt Besuche - Anzahl von Antibiotika/Entwurmungs-Behandlungen - Externe Einträge

Here the farmers agreed with the list of indicators, but the positive and negative qualities of them seemed problematic, so the adjectives were taken out. Stress as an indicator, translated into an aspect of the health of the people on the farm, was deemed a good effective indicator of farm health. And the importance of being able to handle stress was also deemed important. Stress can be drastically reduced when you have a healthy farm, or when you take over a healthy farm. One farmer added (translated): *“When you take over a healthy farm from one generation to the next, you really have won. It makes all the difference than if you take on an unhealthy farm. The foundation is already there for you, the stress will be less.”*

Adding to this line of thought was the idea that perhaps the order of or the indicators themselves might be different at the beginning of taking over a farm then at other durations during a farmer’s experience.

Reflections on Austrian workshop

This workshop was dominated by examples and anecdotal information that often emphasised the points that the statements were representing. This means that the conversations sometimes did not get into the depths of challenging the statements. Often, the research team had to remind the participants of the overall statements and questions behind, in order to get them back on track. The farmers seemed to build a sense of comradery; there were more similarities rather than differences in the group, all small family farms, which seemed to make the decision process smooth. The group was highly motivated and interested in the discussions.

German National Workshop

Statement 1

No original (new statement)	Final DE
	Landwirte, die das Ziel haben, gesunde landwirtschaftliche Systeme zu bewirtschaften, entwickeln die Intuition und die Fähigkeit zur Selbstbeobachtung (z.B.: innere Stimme, Bauchgefühl) als Teil des Beobachtungsprozesses des Betriebes.

This statement was not pulled from the survey data and therefore did not exist coming into the German national workshop. This statement came out of an observation that in almost every statement *intuition, awareness, observation, feeling*, etc. was used in describing the different statements and their background or story. After statement 6 was discussed, one farmer pointed this out by stating (translated):

“In every single point we have discussed awareness, maybe we should have one point at the beginning about this. We think this is something that is quite old, and we lost it, and it might be embarrassing to think about it scientifically, but it is there; this energy, of what we can’t see, but is still there. We are always talking about things that are not actually tangible, in almost every point with awareness or through anthroposophy. I think this is really important and plays a role. Today we have so many people looking for numbers and measurements, but this is something older, something that we have lost, like intuition. It is clear that this plays a role... I can’t always explain why I do something in measurements or tangible acts, instead intuition plays a role; this inner voice, intuition, awareness, a feeling. And it happens at every point (statement). In my mind it should be the first statement, concerning the importance for health.”

It was discussed in the group and agreed that this point of awareness and intuition plays a vital role in farm system health and should be mentioned first. And, although the systems-perspective may be abstract concept, when we talk about the actual farm level it becomes clearer. Therefore this statement was added and placed intentionally as the first statement as a sort of umbrella-statement; one that touches or influences all of the other statements.

Statement 2

Original DE	Final DE
Landwirte, die das Ziel haben, gesunde landwirtschaftliche Systeme zu bewirtschaften, sind sich der Wichtigkeit der Bodengesundheit als Kernpunkt und Basis für die Gesundheit in allen (vielen) anderen Bereichen (z.B.: Pflanze, Tier und Mensch) bewusst.	Landwirte, die das Ziel haben, gesunde landwirtschaftliche Systeme zu bewirtschaften, sind sich der Wichtigkeit der Bodengesundheit als Kernpunkt und Basis für die Gesundheit in allen (vielen) anderen Bereichen (z.B.: Pflanze, Tier und Mensch) bewusst.

The farmers decided nothing was needed to be changed or discussed concerning this definition. All farmers agreed upon the statement and it remained the same from this national farmer workshop to the international farmer workshop.

Statement 3

Original DE	Final DE
Landwirte, welche gesunde landwirtschaftliche Systeme bewirtschaften, beobachten und verfolgen Veränderungen in der Biodiversität auf ihrem Hof ganz genau (speziell Regenwürmer, Brutvögel, Bienen und Nützlinge); und arbeiten kontinuierlich an einer Steigerung und Verbesserung der Biodiversität in ihrem System.	Landwirte, die das Ziel haben, gesunde landwirtschaftliche Systeme zu bewirtschaften, beobachten Veränderungen in der Biodiversität auf ihrem Hof (speziell Regenwürmer, Brutvögel, Bienen und Nützlinge); und arbeiten kontinuierlich an einer Steigerung und Verbesserung der Biodiversität in ihrem System.

Here the farmers discussed how the changes in on-farm biodiversity are monitored, in that farmers have a certain awareness or intuition that they can learn and develop. This deals with observing and monitoring/recording/re-evaluating these observations. It was stated that a farmer could change herself, but not change others. Others, who want to change or to learn, must first be open enough to want to learn or change, and that changes result from them in being so open. This reiterates the point made that other people do not change the farmers but change must come from them. One farmer added (translated): *“I create my own awareness for biodiversity on my farm. And someone else can take something from my actions with them if they want.”*

In the end, the statement did not necessarily reflect this discussion but the wording was changed slightly.

Statement 4

Original DE	Final DE
Landwirte, welche gesunde landwirtschaftliche Systeme bewirtschaften, sind sich bewusst dass sie in (und mit) einem natürlichen System arbeiten; und sind der Meinung dass die höchste Gesundheit erreicht werden kann, wenn alle Domänen im Hof einbezogen sind: Boden, Pflanzen, Tiere und Menschen.	Landwirte, die das Ziel haben, gesunde landwirtschaftliche Systeme zu bewirtschaften, sind sich bewusst, dass sie in (und mit) einem natürlichen/ganzheitlichen System arbeiten; und sind der Meinung, dass die höchste Gesundheit erreicht werden kann, wenn alle Bereiche des Hofes wesensgemäß mit einbezogen sind: Boden, Pflanzen, Tiere und Menschen.

The farmers' discussion vacillated around the inclusion of animals in a healthy farming system. It was however decided, that through the inclusion of wild animals, a healthy farm system includes all domains. Additionally, there was a longer discussion if natural systems should be left in the statement, as it is unclear how far from, or included in natural systems, a farming system can be. It was also pointed out that an organic farming system is distinguished from a conventional or gardening crop cultivation system. The goal ended up being a just, holistic system, supporting or appropriate for all life forms according to their being - 'ganzheitliche Wesensgerechtigkeit' or 'wesensgemäß'.

Statement 5

Original DE	Final DE
Landwirte, welche gesunde landwirtschaftliche	Landwirte, die das Ziel haben, gesunde

Systeme bewirtschaften, haben die gut ausgebildete Fähigkeit um Schlüsselprozesse der Gesundheit auf ihrem Hof ganz genau zu beobachten, und haben einen guten Überblick über das System.	landwirtschaftliche Systeme zu bewirtschaften, entwickeln die Fähigkeit, Schlüsselprozesse der Gesundheit auf ihrem Hof genau zu beobachten und haben einen guten Überblick über das System.
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Many smaller points were mentioned within the discussion concerning this statement; but when asked if the farmers subconsciously do this, or if they recognise that they do this, the conversation became more directed. In the end, it was decided that the farmers develop the skills to observe key health processes on their farms, rather than having trained for such skills. Where each farmer might be within their own model or idea of the key health processes on their farms, was also identified as important for understanding their health processes, therefore they develop skills with their farm, as seen in the improved statement above.

Statement 6

Original DE	Final DE
Landwirte, welche gesunde landwirtschaftliche Systeme bewirtschaften, bewirtschaften einen kleineren Familienbetrieb, und/oder haben die Fähigkeit um die Kapazitäten auf dem Hof optimal zu organisieren um die komplexen Herausforderungen und spezifischen Anforderungen für gute Gesundheit auf größeren Betrieben zu meistern.	Landwirte, die das Ziel haben, gesunde landwirtschaftliche Systeme zu bewirtschaften, achten auf die Überschaubarkeit von Flächen und Prozessen, und deren verantwortungsvoller Gestaltung, damit die Komplexität oder Größe des Betriebes nicht zu Lasten der Gesundheit fällt.

Here, the specific point of *family* farm came into contention. The discussion revolved around the idea if a farm needs children to be healthy, that a farm can be run by a cooperation of owners or partners, and that a new participant outside of the family can run it too. So the specification of family was left out. It was still noted that the main point of the inclusion of family might have been to put a boundary on scale or size of what can be healthy or managed healthy. The idea of a farmer's responsibility in providing food and their responsibility to be aware and able to manage a healthy farm stemmed from this discussion.

There was a brief dialogue to decide if this principle should be split into two, to separate the idea of size and scale and the responsibility and respect of farmers for farm organisation. Yet the idea of family was removed and the conversation of a farmer's responsibility was integrated more heavily into the improved statement.

An interesting concept that was discussed here and was not integrated into the statement (probably due to it being slightly tangential) was the discussion of the identity of a farm, that a farm has a biography (e.g. its own history, name etc.) that seems to be very important not only to the farmers but for the future of the farm itself.

Statement 7

Original DE	Final DE
Das Hauptziel von Landwirten, welche gesunde landwirtschaftliche Systeme bewirtschaften, ist	Das Hauptziel von Landwirten, welche gesunde landwirtschaftliche Systeme bewirtschaften

verlagert, weg von Produktivität (z.B.: Hochleistungsrassen und Sorten), hin zu anderen Qualitäten wie Biodiversität oder artgerechte Tierhaltung: Stabilität anstelle von Wachstum/Produktivität.	wollen, verlagert sich weg von der Massen-Produktion hin zur Qualitäts-Produktion.
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The group discussed the negative use of productivity as being problematic. The example of a natural system being highly productive was used. The participants decided that intensification might be more of a problem. Yet there were feelings that it was also organic farming's 'duty' to intensify in order to feed the world, while keeping quality a priority. The idea of there being a threshold which a farmer can cross, and where the quality of their products might diminish, was also part of the conversation. Especially being able to recognise and distinguish this border was seen as crucial skill. The resulting statement above is much shorter and focused more on mass production and quality than productivity and quality.

When discussing statement 7, one farmer highlighted different versions of productivity. He distinguished this as productivity in conjunction to that of which he could sell or in relation to his product and not productivity in terms of natural productivity on his farm. He stated that there are plenty of positive side effects from organic agriculture but that they should not be defined under productivity. He believed that productivity related to biodiversity or other natural types need to be a separate point or statement. This was not reflected in the improved statement.

Statement 8

Original DE	Final DE
Landwirte, welches schon länger (mehr als 10 Jahre) nach ökologischen Richtlinien arbeiten, neigen dazu, ihren Schwerpunkt der Verbesserung der Gesundheit von einjährigen Kreisläufen zu einer weiteren Sichtweise des Systems zu verlagern. Zum Beispiel mit der Verbesserung der Gesundheit durch das Einbauen von langjährigen Strukturen auf ihrem Hof (z.B.: Mehrjährige Kulturen, Habitate für Wildtiere, Hecken, Hochstamm Bäume etc.).	Landwirte, die das Ziel haben, gesunde landwirtschaftliche Systeme zu bewirtschaften, verbessern die Gesundheit durch die Planung in einer weiten/langfristigen Sichtweise des Systems. Zum Beispiel mit der Verbesserung der Gesundheit durch das Einbauen von langjährigen Strukturen auf ihrem Hof (z.B.: Mehrjährige Kulturen, Habitate für Wildtiere, Hecken, Hochstamm Bäume etc.).

Although it was stated that each farmer definitely needs a few years of experience to really understand their farm and perhaps how to plan appropriately for the future of their farm, all of the participants decided that a long-term plan could be integrated from the beginning of a farmer's experience. The fact that a farmer will have to change and develop that plan accordingly is simply the reality of farming. Additionally discussed was the role of ownership and how such a role makes a difference for long-term plans in farmland that is rented.

Statement 9

Original DE	Final DE
Landwirte sehen den Hauptmechanismus, wie sie der menschlichen Gesundheit beitragen	Landwirte, die das Ziel haben, gesunde landwirtschaftliche Systeme zu bewirtschaften,

können, in ihren qualitativ hochstehenden Produkten (Nahrungsmittel); sie sind sich jedoch viel weniger bewusst, dass sie auch in anderen Bereichen wichtige Beiträge leisten (z.B.: durch die Schonung der Umwelt, öffentliche Güter etc.)	brauchen das Bewusstsein, dass sie nicht nur durch ihre qualitativ hochwertigen Produkte (Nahrungsmittel) zur menschlichen Gesundheit beitragen, sondern dass sie auch in anderen Bereichen wichtige Beiträge leisten (z.B.: durch die Schonung der Umwelt, öffentliche Güter etc.).
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The farmers generally agreed upon this statement, however the lexical semantics of the term 'principle mechanism' (Hauptmechanismus) and 'qualitatively superior' (qualitativ hochstehend) were questioned. The terms 'main input' (Hauptbeitrag) and 'high-value' (hochwertig) were given as suggestions instead. The resulting statement was reformulated as shown above.

Statement 10

Original DE	Final DE
Landwirten stehen wenige geeignete Werkzeuge oder Methoden zur Verfügung um den Gesundheitsbeitrag des Hofes als gesamten Systems, oder weitere ‚Outputs‘ ihres landwirtschaftlichen Systems zu bewerten oder zu messen.	Landwirte brauchen geeignete Werkzeuge oder Methoden um den Gesundheitsbeitrag des Hofes als Ganzes, oder weitere ‚Outputs‘ ihres landwirtschaftlichen Systems zu bewerten und zu messen.

This statement spawned a lengthy description of what types of tools and measurements are currently available to rate and benchmark farming systems and how useful they might be. This was discussed at such length that it was suggested to just drop the statement altogether, however it was found that the statement was, in the end, important for the health of organic farming systems. The statement was simply reworded to reflect that there are actually many tools, just very few which are helpful for farmers, to measure the health of their system.

Additional Collected Advice

Original DE	Final DE
<p>Aus der Sicht der Landwirte, die ersten und sichtbarsten Indikatoren von Gesundheit (positiv und negativ) auf dem Hof sind:</p> <ul style="list-style-type: none"> - Bessere Bodenfruchtbarkeit und Boden-„bearbeitbarkeit“, - höhere Biodiversität, - verbesserte Gesundheit der Menschen auf dem Hof (z.B.: weniger Stress, Verletzungen etc.), - höhere Ernten, - geringere Anzahl der Tierarzt Besuche, - geringere Anzahl von Antibiotika/Entwurmungs-Behandlungen, - Reduktion der externen Einträge 	<p>The first and most apparent indicators of health on the farm are:</p> <ul style="list-style-type: none"> - Bodenfruchtbarkeit - Boden-bearbeitbarkeit - Pflanzenkrankheits- und Unkrautdruck - Biodiversität - Gesundheit der Menschen auf dem Hof - Ernte - Anzahl von Tierarzt Besuchen - Anzahl von Antibiotika/Entwurmungs-Behandlungen - Einsatzes fremder Betriebsmittel

Although not a statement, to the farmers, the list seemed a way to reflect important survey answers. They were not discussed much. The farmers just decided that they were suggestions and not really a collective statement towards health.

Reflections on German workshop

What was particularly interesting was the development of the importance and use of gut-feelings and intuition in conjunction with farm system health. Most of the German farmers were biodynamic farmers, which may have an influence on how aware of or concerned they were of awareness, observation and intuition.

United Kingdom workshop

Statement 1

Original UK	Final UK
Farmers who run healthy farming systems are aware that soil health is most important and the base for health in all (many) other domains: plant/animal/human/farm/products.	Farmers who aim to run healthy farming systems are aware that soil health is fundamental for health in all other domains: plant/animal/human/ecosystems.

The farmers agreed that soil health is the base/fundament upon which all other farm health is built. However, at a given moment one of the domains might be more important. The difference between a soil that is healthy for production and one that is healthy for biodiversity was also noted and it is therefore important to consider what the goal of health is. Because every farm is different, it was up to the farmer to interpret which type of soil health he/she is seeking on the farm.

The farmers also felt it was important to add an environmental domain, which led to the replacing 'products' with 'ecosystems'.

Statement 2

Original UK	Final UK
Farmers who run healthy farming systems closely observe changes in biodiversity on their farm (particularly earthworms, farmland birds, bees and beneficial insects) and aim for high and increasing biodiversity in their system.	Farmers who aim to run healthy farming systems aim for high and increasing biodiversity in their system; they are able to recognise and closely observe changes in biodiversity which contributes to the function of the agro-ecosystem (particularly earthworms, farmland birds, bees and beneficial insects).

The farmers found the original statement too passive, and emphasised that farmers should be actively improving, rather than merely observing, biodiversity. It is critical to aim for high and increasing biodiversity.

The UK farmers were confident that they knew how to monitor biodiversity on their farms due to the large amount of monitoring that already takes place. They felt it is important to be able to quantify changes in biodiversity rather than just saying you support it. This led to the addition of "recognise" to the second half of statement.

The farmers stated that organic farmers see biodiversity as an essential part of a working farm system, in contrast with an oasis approach where areas for biodiversity are set aside. The farmers felt that biodiversity that supports/hinders production must be paid particular attention compared with biodiversity that does not affect production. However, the farmers felt that there was also an interest in biodiversity more generally; they support biodiversity because it's right for the long term (sustainability).

Statement 3

Original UK	Final UK
Farmers who run healthy farming systems are aware of working in a natural system and feel	Farmers who aim to run healthy farming systems are aware of working with nature's

that best health is achieved when all domains are part of the system: soil, plants, animals and humans (livestock <-> stockless).	systems and feel that best health is achieved when all domains are part of their agro-ecosystem: soil, plants, animals and humans.
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The farmers discussed the necessity of having livestock versus animals in general on the farm. They saw this as being about nutrient cycling, in which case stockless farms are required to address this by growing their own green manure or producing compost etc. However, when looking beyond nutrient cycling, it was agreed that the system needs to be a whole/closed system and have system integrity, whereby there was a focus on processes – the farm didn't necessarily need domesticated animals, as long as something else was fulfilling their role in the system.

The farmers agreed that organic farms are not natural systems, in the sense of functioning as if humans were not present/controlling them. They do not work with nature in the sense of a pristine/essential Natural System that they draw upon, but rather that they look to natural systems because these have worked for millions of years, and try to implement them on the farm. One farmer stated “*We do our bit and then kind of hope the right thing happens*”, i.e. arrange the parts to encourage what you want to happen, but then allow natural processes to run it.

Substitute terms for *nature/natural* were suggested: *biological* was rejected because it allowed for use of bio-pesticides etc.; ambivalent about *ecosystems*; *natural cropping system* was rejected because it implied a relation to some essential natural system (rather than looking to natural processes and bringing them in to the farming system); *natural processes* was rejected because it would lead to a permaculture system, also because *processes* sounds too linear. There was general and enthusiastic support for *nature's systems*.

The phrase working *with* nature was preferred over working *in* nature. There was a discussion about the extent to which this removed the farmer from the system. The farmers saw themselves as working with (rather than against) nature. Working *in* nature was seen as working in a wilderness area. Working with *natural systems* was considered inaccurate, because the natural system would be quite different without the farmer dominating it.

Statement 4

Original UK	Final UK
Farmers who run healthy farming systems have a well-developed ability to closely observe key health-related processes on their farm, have a good overview of the system.	Farmers who aim to run healthy farming systems need to have a well-developed ability to closely observe key health-related processes on their farm and react appropriately, have a good overview of the system.

The farmers felt that the original wording of the statement was too passive: they have to be able to not just observe, but to work out what is the right response, and to implement it. They adapted the statement accordingly. The farmers also questioned the meaning of “key health related processes”. This was not resolved, and could be continued at another opportunity.

Statement 5

Original UK	Final UK
Healthy farms are small-scale farms, and/or are able to organize the capacities of the farm to face the complexity of the system. Large-scale farms may require different processes and organisational structures to achieve health.	Farmers who aim to run healthy farming systems are able to organise the capacities of the farm to face the complexity of the system; different scale farms require different processes and organisational structures to achieve health.

The farmers strongly disagreed with the assertion that health is related to farm scale. They felt that the common assumption that small farms are necessarily healthier is misleading. Farms need appropriate management/staff at all scales. Diversity may have to be achieved through different actions or may require different organisational structures.

According to one farmer, organisational structures refers to *“how you deal with scale in terms of organisation, ... ability of labor, skills, and that might mean you have different field sizes, different housing systems and so on.”* It also includes the number of enterprises, diversity of cropping, non-farmed habitats. The farmers agreed that healthy farms need to organise the capacities of their farm, and decided to change the statement accordingly.

Statement 6

Original UK	Final UK
The main aims of farmers who run healthy farming systems shift away from productivity, top-performance breeds and high yields towards other qualities like biodiversity and animal welfare: stability rather than growth.	Farmers who aim to run healthy farming systems select suitable and appropriate breeds and varieties to achieve multiple outcomes such as quality, optimum yield, resilience, animal welfare, biodiversity, etc.

There was strong disagreement that organic farmers “shift away from productivity”. Productivity was considered the wrong word and replaced by *yield*. Yield was considered very important because the farm relies upon it to survive. However, it was also important to broaden one’s ambitions beyond yield, e.g. including soil fertility building phases, which means periodically lower yield in cropping systems. Organic farmers need to select for yield, but they cannot have the highest yielding variety/breed that is also prone to diseases. They pick the highest yielding breeds/varieties that also satisfy other constraints of the system. This discussion led to the inclusion of “multiple outcomes” and the substitution of “optimum” for “maximum” yield.

Resilience and risk aversion were considered to be good values upon which to manage the farm, e.g. having more resilient breeds. Farmers were unclear what “stability” referred to, but thought it might mean having a more risk adverse approach through diversity of products (eventually this concept was merged with resilience).

Statement 7

Original UK	Final UK
Farmers who have been certified organic for longer (i.e. more than 10 years) tend to shift their focus from improving health in annual growing cycles towards a broader view of the	Farmers who have been certified organic for a longer time, continue to improve health in annual growing cycles while evolving a broader view of the system; improving health by

system; improving health by incorporating more long-term structures on their farm (structural changes like e.g. perennials, habitats, hedges, trees etc.).	incorporating longer term structures on the farm (changes like longer rotations, perennials, habitats, hedges, trees etc.).
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The group agreed that organic farmers begin to feel more confident once the conversion period is over and become more capable and knowledgeable of thinking longer term. There is a gradual move away from what you already know and your understanding of what health is on the farm changes. However, the farmers do not wish to encourage new organic farmers to think that they do not need to think long term early on. Similarly, successful conversion after 3 years is not the goal, the learning process and development is ongoing.

However, the farmers disagreed that you shift away from annual growing cycles to longer term, because you have to have both. Annual cycles were seen as part of much longer cycles and perceiving them as annual cycles leads to downfall. This discussion led to the inclusion of both cycles and structures in the final UK statement.

When prompted by the research team, the farmers discussed the role of ownership of the system. They did not find it necessary to have legal ownership of the land, but farmers need to have security of tenure in order to be willing to invest in longer term structures and processes. This discussion led to the farmers to substitute “their system” with “the system”.

Statement 8

Original UK	Final UK
<p>From the perspective of farmers who run healthy farming systems, the first and most apparent indicators (both positive and negative) of health on the farm are:</p> <ul style="list-style-type: none"> • soil fertility and changing difficulty of working the soil, • increasing biodiversity, • improvements of the health of people on the farm (stress, injuries), • increasing yields, • number of veterinarian visits, • number of antibiotics/wormer/medicine uses, • reduction of external inputs 	<p>The first and most apparent indicators of health on the farm are:</p> <ul style="list-style-type: none"> • Soil fertility • Soil workability • Biodiversity • Health of people on the farm • Yields • economic value of products • number of veterinarian visits and treatments, use of antibiotics/wormer/medicine • external inputs • weeds, pests and diseases.

The wording of this statement was not clear to the farmers. There was some confusion around the phrase “both positive and negative” and the meaning of “indicator”. Several of the indicators were considered confusing because changes in both directions (e.g. more and less yield, more and fewer veterinary visits) could mean positive or negative changes to farm health.

The farmers were at first unclear about the meaning of “apparent” (here used as “visible” or “noticeable”) in “first and most apparent indicators”. However, “first and most apparent” was considered important because it is what the farmers saw first.

The farmers discussed adding another set of indicators that are less apparent, but important, because some critical indicators are not included on the list of “first and apparent ” indicators. E.g. product/food quality, pollution, social /customer feedback, animal welfare.

Individual indicators were also discussed: Friable soil was considered a reasonable indicator of soil fertility and implies that it is workable. However, soil fertility itself was considered unclear. Soil fertility did not equate with soil health, because this should also include the soil’s potential. It was also unclear what yield told the farmer about the health of the farm. The farmers did, however, agree that yield is an early indicator of change to system. Similarly, the financial/economic value of the product was considered a very useful indicator. Increased value of produce was considered to be a positive indicator because a sustainable business has to be profitable. Finally, weeds, pests, and diseases are seen as crucially important as indicators in your system.

The farmers emphasised that the importance of certain indicators change the longer you have been farming. For example, farmers who have been farming organically for a longer period would already be used to less antibiotics etc.

Statement 9

Original UK	Final UK
Farmers see their main mechanism to contribute to human health is through their high quality products (food) indicated by consumers, and are much less aware of other areas (e.g. public goods, environment etc.).	Farmers who aim to run healthy farming systems aim to communicate with and involve customers/consumers/retailers/processors to get across the story and value of the product and the farm.

The farmers defined “public goods” as something you don’t have to pay for. They agreed that farmers should see their benefits to humankind as being more than just food. They disagree that quality products are seen as the main output. For them environment is at least equally important. They also discussed what was meant by “sufficiently aware” of public goods and what were the means of measuring public goods (this relates also to the next statement). They question whether organic farmers should try to be aware of all public goods, and if so, why? They felt that different farmers focus on different public goods and are probably good at measuring those, but can’t measure the totality of benefits of the farming system. However, the farmers expressed that they do want to be able to measure these benefits because it shows all the good they are doing. They make the point that when starting out you are ill equipped to monitor what’s going on and may not even know what to monitor long term.

The farmers’ perceptions of the importance of different public goods depend upon farm type, region and the farmer’s interaction with consumers. The farmers felt that the UK consumers were less willing to pay higher prices for organic food, and that they saw personal health and environment as the key benefits of organic. The farmers were unsure if it is the job of the farmer to educate the consumer, despite the fact that they agreed that it is crucial that the consumer be better informed. The farmers found two reasons for pursuing this, one is that it will help the farmer develop the farm system; the other is that it will help improve consumer health, because they will have a relationship with the farmer.

Many, if not most, farmers in the UK do not have a direct connection with the customer because they send product to processors or retailers. One farmer stated that *“For the long term health of any organic farming system, it’s important for that farm to try to engage with their market, their customers in whatever way they can, in order to get across the narrative of what’s happening on the farm”*, but felt that the British system does not encourage this. It is also important to engage with buyers and processors by having a relationship with them and building up trust. This was seen as chipping away at the food system to make it more accommodating.

Statement 10

Original UK	Final UK
Farmers are not sufficiently equipped with tools and methods to assess and measure their health contribution in other aspects of their system’s outputs (e.g. public goods, fresh air, clean water, etc.).	Farmers are not sufficiently equipped with tools and methods to assess and measure their health contribution in other aspects of their system’s outputs (e.g. public goods like water and air quality, environment and landscape, biodiversity, etc.).

There was no separate discussion of this statement. The discussion took place as part of the previous statement, and no specific wording change was agreed upon.

Reflections in the United Kingdom workshop

Some of the farmers invited to the UK national workshop were farm managers, while others were farm owners. All were well established as organic farmers, but from different regions and focusing on different products, working on different size farms. The farm managers were able to dispel some apparent misconceptions among other farmers about the commitment to long-term farm system health in managed vs. owned farms. Farmers selling their products on farmers markets or farm shops identified how their positions in the agri-food system, relative to the consumer, might give them advantages/disadvantages with regard to communicating about public goods produced by their farms.

It is worth mentioning that a high level of involvement of members of the research team in the discussions (especially statement 3) may have influenced differences in the UK versus the German and Austrian statements.

3.3.2 Important differences between the three national workshops

In this second part of the statement development section, a cross-country comparison is made of the discussions and formulations of each statement.

Statement 1 (additionally developed statement during the workshops in Germany and Austria)

The Austrian and German farmers added two new statements respectively. The Austrian farmers focused upon knowing and respecting the resources of the farmer and farm, including basic trust and social networks, and being able to observe or to learn to observe the processes on the farm. The German statement emphasised the development of intuition and self-observation, the ability to listen to and trust 'gut-feelings', and also daring to follow them through (even if the neighbour or colleagues are sceptical or disagree). Although the British farmers did not create a new statement, many of the themes that led to its creation in the German and Austrian workshops, such as building trusted networks and being committed to the farm and to understanding it as a system, also occurred within the UK workshop. In later discussions it became clear that some farmers felt these points were neglected at the UK workshop, also the UK farmers themselves. These two statements were included in the list of key statements leading up to the international organic farmer workshop. The results from that workshop show that all participating farmers from all countries found this point to be important, even crucial, to farm health management.

Statement 2 (soil health)

The Austrian, German and UK versions of this statement had no differences in meaning, with the exception of the gendered language within the German statement (which was applicable to all following statements), that appeared to exclude female farmers.

Statement 3 (biodiversity)

Biodiversity was particularly discussed at the UK workshop and was central to their understanding of managing farm system health. They emphasised taking an active role in improving biodiversity and expressed confidence in recognising changes in biodiversity and knowing methods of increasing biodiversity on their farms. In contrast, the Austrian farmers focused upon quietly observing changes in biodiversity on their farm in detail, and the need to give nature room and time for self-organisation. The German farmers saw humans as part of nature and emphasised the importance of symbiosis between all organisms on the farm.

Statement 4 (livestock / all domains present on the farm)

The Austrian and German farmers developed very similar adaptations to this statement, feeling that farmers work *in* and *with* a natural system, and that the highest health is achieved when all domains are present on the farm (soil, plant, animal and human). The German farmers in particular emphasised the many ways livestock contribute to farm health and some described the necessity of having livestock present for overall farm health. The UK farmers saw themselves as working *with* rather than *in* nature's systems, and saw farming as a human imposition upon and control over nature.

Statement 5 (observing key processes and having an overview of the farm)

The Austrian farmers believed that, in addition to the skills to observe the key processes of farm health, one also needed to have the skills to deal with social and logistical pressures resulting from complex systems. In Germany, the farmers stated that they develop the skills to observe key health processes on their farms over time, rather than having trained for such skills. The UK farmers felt that the original wording of the statement was too passive: they have to be able to not just observe, but to work out what is the right response, and to implement it.

Statement 6 (overview and management of capacities)

The Austrian farmers felt that, because they were all coming from small farming backgrounds and perspectives, that they personally identified with the management of smaller family farms and that gave the ability to optimally organise the capacities of the farm. But they believed that it was possible to manage the complexity and specific needs of health on a larger farm too. They stated that in order to do so, larger farms simply need more organisational structures, as they believed the larger the farm the more complex. The German farmers decided that obtaining an overview of a farm's land and processes and their responsible organisation and management was very important. But they also agreed that this is possible at varying sizes, so the complexity of the size of the farm does not necessarily negatively affect health. The UK farmers stated that, to achieve health, farmers or farm managers need to be able to recognise and organise the capacity of a farm, and therefore can face the complexity of the system, regardless of the size. It was important for them to note that different scales of farms require different processes.

Therefore the statements were similar across the countries. It was also striking that stress was mentioned in conjunction with this statement in each country workshop.

Statement 7 (shift in values and aims)

The Austrian statement focused upon shifting away from productivity (described as focused on higher and higher yields and high performance breeds and varieties) towards different (non-economic) values, such as food/product quality and animal welfare. The German farmers, however, emphasised that the main aim is to move away from mass production towards quality production. Meanwhile the UK farmers emphasised the need for *optimum* yields and selecting suitable breeds and varieties, appropriate for the specific site, to achieve resilience, sustainability and multiple outcomes.

Statement 8 (longer term planning and structures)

The statements of the Austrian and German farmers were very similar in how important long term planning is for the health of farms. The Austrian group discussed how long term planning is different and more difficult for new entrants and inexperienced farmers; yet it is still included in the planning of the farm. Contrastingly, the UK farmers had reservations about linking such developments to time and felt that incorporating long term planning was important at all stages.

Statement 9 (variety of contributions to human health, communicating values of products)

The Austrian farmers saw a need to decouple food production from market-thinking and to sell the life story or the full history of the product (e.g. cultural landscape). The German farmers sought

awareness that they do not only contribute to human health through their high quality product, but also deliver in other areas e.g. environmental protection. The UK farmers wished to communicate the history and value of product to their customers, but felt that the agri-food system in England limited them in this regard.

Statement 10 (need for better tools to assess public goods)

The Austrian farmers strongly felt that there are too many measurement and benchmarking tools, which bring a lopsided focus on productivity and quantity. They very much believed that tools to measure ‘farm performance’ with this regard lead to more standardisation and certification impeding their organic ‘lifestyles and process’.

Statement 11 (indicators of health)

The German farmers added weeds and pests to the list of apparent indicators. The UK farmers added weeds, pests and economic value, and also created a list of less apparent indicators. The UK farmers added a separate list of ‘less apparent, more difficult to measure and monitor indicators of health’ to reflect the fact that indicators change as the farm develops, and as the farmers gain a deeper knowledge and understanding of their farms. This list included food quality, environmental impact (water quality, pollution, erosion etc.), economic resilience, relationship with the local community, customer satisfaction, animal welfare/mortality rates.

3.3.3 International Farmer Workshop

In the third part of this section, the comparison of the statement formulation pre- and post-international farmer workshop is presented, following the same structure as for the national workshops. The two new statements developed at the Austrian and German national workshops were combined and included in the list of key statements, both labelled “statement 1” and discussed as a single statement (which was agreed upon with all farmers later during the workshop).

In the following tables, the statements of the national workshops (WSI; in the United Kingdom (UK), Germany (DE) and Austria (AT)) are compared to the final statements agreed by the farmers brought together at the international workshop (WSII). This description of the international workshop is capped with a reflection of the workshop process.

Statement 1

	From WSI	Final WSII
UK	N/A	Farmers who aim to run healthy farming systems develop the intuition and ability for self-observation (e.g. (dare to listen to) inner voice, gut-feeling) as part of the observation process of the farm; and they are aware of their own strengths and weaknesses and know their own resources and those of the farm (e.g. social network, basic trust).
DE	Landwirte, die das Ziel haben, gesunde	Bauern und Bäuerinnen, die das Ziel haben,

	landwirtschaftliche Systeme zu bewirtschaften, entwickeln die Intuition und die Fähigkeit zur Selbstbeobachtung (z.B.: innere Stimme, Bauchgefühl), als Teil des Beobachtungsprozesses des Betriebes.	gesunde landwirtschaftliche Systeme zu bewirtschaften, entwickeln die Intuition und die Fähigkeit zur Selbstbeobachtung (z.B.: (sich trauen auf die) innere Stimme, Bauchgefühl (zu hören)), als Teil des Beobachtungsprozesses des Betriebes; sie sind sich der eigenen Stärken und Schwächen bewusst und kennen ihre eigenen Reserven und die des Betriebes (z.B.: sozialer Halt und Netzwerk, Urvertrauen etc.).
AT	Bauern und Bäuerinnen, welche gesunde landwirtschaftliche Systeme bewirtschaften, sind sich der eigenen Stärken und Schwächen bewusst und kennen ihre eigenen Reserven und die des Betriebes (Sozialer Halt und Netzwerk, Urvertrauen etc.).	

This statement was added by the Austrian, respectively German farmers at their national workshops, but not by the UK farmers. This was the first time the UK farmers had evaluated this statement: they recognised that they had discussed similar aspects in their own national workshop and fully agreed that this should have resulted in an additional statement in the list.

The farmers described *intuition* variably as a personal concept and as something universal. You can personally observe the farm using subjective, personal intuition, but the thing you are observing is the “soul” level of the farm, which some considered to have an objective/universal truth. *“To listen to intuition is the same, but the solutions are different for every farm”* (German farmer, translated). Further they described the importance of being fully emotionally and spiritually engaged with, and committed to what you are doing.

It was considered important that farmers dare to listen to their intuition and gut feeling (the latter is sometimes described as less “right” than intuition) regardless of rational explanation or differing views of others. This means being *“mindful and not simply following instructions”* (Austrian farmer, translated). It requires self-reflection and self-observation, which new farmers could learn from those with more experience.

In the discussion it was also clarified and emphasised that farm managers/workers can (and should) have intuition, not just the owners, and make use of it. This is dependent upon having a clear philosophy, strategy and shared aims, which is known by farm managers and shared with farm workers. There also needs to be a strong external support network to draw upon. However, not everyone needs the same level of intuition. E.g. *“The person who drives the machine needs to know about soil health, but not necessarily the entire system”* (German farmer, translated). The lead decision maker must be aware that his/her decisions have a much deeper/wider effect than others who work on the farm.

Statement 2

	From WSI	Final WSII
UK	Farmers who aim to run healthy farming systems are aware that soil health is fundamental for health in all other domains: plant/animal/human/ecosystems.	Farmers who aim to run healthy farming systems are aware that soil health is fundamental and the base for health in all other domains (plant, animal, human, ecosystems).
DE	Landwirte, die das Ziel haben, gesunde	Bauern und Bäuerinnen, die das Ziel haben,

	landwirtschaftliche Systeme zu bewirtschaften, sind sich der Wichtigkeit der Bodengesundheit als Kernpunkt und Basis für die Gesundheit in allen (vielen) anderen Bereichen (z.B.: Pflanze, Tier und Mensch) bewusst.	gesunde landwirtschaftliche Systeme zu bewirtschaften, sind sich der Wichtigkeit der Bodengesundheit als Kernpunkt und Basis für die Gesundheit in allen anderen Bereichen (Pflanze, Tier, Mensch und Ökosystem) bewusst.
AT	Bauern und Bäuerinnen, welche gesunde landwirtschaftliche Systeme bewirtschaften, sind sich der Wichtigkeit von Bodengesundheit als Kernpunkt und Basis für die Gesundheit in allen (vielen) anderen Bereichen (z.B.: Pflanze, Tier und Mensch) bewusst.	

The farmers were generally happy with the wording of this statement from the national workshops. "Ecosystems" were agreed to be added to the list of domains in the German language statement to match the list in the English language statement.

The gendered language of the German statements gave rise to the question of whether the statements were equally applicable to all genders. The farmers considered there to be no difference between the genders with regard to the ability to run a farm. It was agreed that this was not the forum for a deeper discussion about gender equality, and a note on gender was added to the preamble of the list of statements.

Statement 3

	From WSI	Final WSII
UK	Farmers who aim to run healthy farming systems aim for high and increasing biodiversity in their system; they are able to recognise and closely observe changes in biodiversity which contributes to the function of the agro-ecosystem (particularly earthworms, farmland birds, bees and beneficial insects).	Farmers who aim to run healthy farming systems recognise and closely observe changes in biodiversity (particularly earthworms, farmland birds, bees and beneficial insects); and they aim for high and increasing biodiversity in their system, which contributes to the function of the agro-ecosystem.
DE	Landwirte, die das Ziel haben, gesunde landwirtschaftliche Systeme zu bewirtschaften, beobachten Veränderungen in der Biodiversität auf ihrem Hof (speziell Regenwürmer, Brutvögel, Bienen und Nützlinge), und arbeiten kontinuierlich an einer Steigerung und Verbesserung der Biodiversität in ihrem System.	Bauern und Bäuerinnen, die das Ziel haben, gesunde landwirtschaftliche Systeme zu bewirtschaften, beobachten und verfolgen Veränderungen in der Biodiversität auf ihren Hof ganz genau (speziell Regenwürmer, Brutvögel, Bienen und Nützlinge); und arbeiten kontinuierlich an einer Steigerung und Verbesserung der Biodiversität, welche zur Funktion des landwirtschaftlichen Systems beiträgt.
AT	Bauern und Bäuerinnen, welche gesunde landwirtschaftliche Systeme bewirtschaften, beobachten und verfolgen Veränderungen in der Biodiversität auf ihren Hof ganz genau (speziell Regenwürmer, Brutvögel, Bienen	

	und Nützlinge); und arbeiten kontinuierlich an einer Steigerung und Verbesserung der Biodiversität. (Ruhe halten und beobachten, geschehen lassen, der Natur den Raum geben zur selbst-organisation!).	
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The farmers agreed that biodiversity is a key function of the agricultural system and not just an effect. However, some farmers voiced concern that they may not be able to adequately recognise and observe changes in soil (micro-)fauna, and suggested that further education is needed.

Statement 4

	From WSI	Final WSII
UK	Farmers who aim to run healthy farming systems are aware of working with nature's systems and feel that best health is achieved when all domains are part of their agro-ecosystem: soil, plants, animals and humans.	Farmers who aim to run healthy farming systems are aware of working in and with nature's systems and feel that best health is achieved when all domains are included according to their being/needs, as part of the agro-ecosystem: soil, plants, animals and humans.
DE	Landwirte, die das Ziel haben, gesunde landwirtschaftliche Systeme zu bewirtschaften, sind sich bewusst dass sie in (und mit) einem natürlichen/ganzheitlichen System arbeiten; und sind der Meinung dass die höchste Gesundheit erreicht werden kann, wenn alle Bereiche des Hofes wesensgemäß mit einbezogen sind: Boden, Pflanzen, Tiere und Menschen.	Bauern und Bäuerinnen, die das Ziel haben, gesunde landwirtschaftliche Systeme zu bewirtschaften, sind sich bewusst dass sie in und mit einem natürlichen System arbeiten; sie sind der Meinung, dass höchste Gesundheit erreicht werden kann, wenn alle Bereiche des Hofes wesensgemäß mit einbezogen sind: Boden, Pflanzen, Tiere und Menschen.
AT	Bauern und Bäuerinnen, welche gesunde landwirtschaftliche Systeme bewirtschaften, sind sich bewusst, dass sie in (und mit) einem natürlichen System arbeiten; und sind der Meinung dass die höchste Gesundheit erreicht werden kann, wenn alle Domänen im Hof einbezogen sind: Boden, Pflanzen, Tiere und Menschen (Größen-abhängig!).	

Initially, the farmers disagreed about whether livestock was necessary for the health of the farm. One farmer considered this an 'old-fashioned' view and pointed out that farms often had too high numbers of livestock, whereas another felt something was missing from the "soul" of the farm when livestock was not present. It was noted that animals perform specific functions on the farm, by processing and recycling materials, but that these functions do not necessarily have to be performed by livestock. Other (wild) animals on the farm, such as earthworms, beneficial insects and other wild animals are actively encouraged. It was questioned whether, if the statement refers to all animals, it may be redundant, as there will always be animals on the farm. It was suggested

that the crucial issue is achieving a balance between animal and non-animal life within the farm system.

All the farmers agreed that the main message of this statement is that animals should be included on the farm according to their being/requirements/needs (in German "Wesensgemäß"). This idea is captured with the phrase in the UK statement "working with nature", i.e. that the farmer should treat all domains according to their being and needs: e.g. recognising that each animal has certain needs (such as physical and emotional welfare) and act/treat it accordingly.

Statement 5

	From WSI	Final WSII
UK	Farmers who aim to run healthy farming systems need to have a well-developed ability to closely observe key health-related processes on their farm and react appropriately, have a good overview of the system.	Farmers who aim to run healthy farming systems develop the ability to closely observe key health-related processes on their farm and react appropriately; they have a good overview of the system.
DE	Landwirte, die das Ziel haben, gesunde landwirtschaftliche Systeme zu bewirtschaften, entwickeln die Fähigkeit, Schlüsselprozesse der Gesundheit auf ihrem Hof genau zu beobachten und haben einen guten Überblick über das System.	Bauern und Bäuerinnen, die das Ziel haben, gesunde landwirtschaftliche Systeme zu bewirtschaften, entwickeln die Fähigkeit, Schlüsselprozesse der Gesundheit auf ihrem Hof genau zu beobachten und entsprechend zu handeln, und haben einen guten Überblick über das System.
AT	Bauern und Bäuerinnen, welche gesunde landwirtschaftliche Systeme bewirtschaften, haben die gut ausgebildete Fähigkeit um Schlüsselprozesse der Gesundheit auf ihrem Hof ganz genau zu beobachten, und haben einen guten Überblick über das System.	

All participants readily accepted this statement. In particular, the inclusion of "react appropriately" from the UK farmer group, which was added to the German language statement. It was however remarked that "reacting appropriately" sometimes also means choosing, and knowing when, not to act.

Statement 6

	From WSI	Final WSII
UK	Farmers who aim to run healthy farming systems are able to organise the capacities of the farm to face the complexity of the system; different scale farms require different processes and organisational structures to achieve health.	Farmers who aim to run healthy farming systems ensure the manageability (overview) of areas and processes (diversity, integrity and sustainability), their responsible organisation (design) and optimal organisation of capacities on the farm, so that the complexity and size of the farm does not negatively affect health (also social and societal health). Different scale farms require different processes and organisational

		structures to achieve health.
DE	Landwirte, die das Ziel haben, gesunde landwirtschaftliche Systeme zu bewirtschaften, achten auf die Überschaubarkeit von Flächen und Prozessen, und deren verantwortungsvoller Gestaltung, damit die Komplexität oder Größe des Betriebes nicht zu Lasten der Gesundheit fällt.	Bauern und Bäuerinnen, die das Ziel haben, gesunde landwirtschaftliche Systeme zu bewirtschaften, achten auf die Überschaubarkeit von Flächen und Prozessen (Diversität, Integrität und Nachhaltigkeit), deren verantwortungsvoller Gestaltung und optimaler Organisation von Kapazitäten, damit die Komplexität oder Größe des Betriebes nicht zu Lasten der Gesundheit
AT	Bauern und Bäuerinnen, welche gesunde landwirtschaftliche Systeme bewirtschaften, bewirtschaften einen kleineren Familienbetrieb, und/oder haben die Fähigkeit um die Kapazitäten auf dem Hof optimal zu organisieren um die komplexen Herausforderungen und spezifischen Anforderungen für gute Gesundheit auf größeren Betrieben zu meistern.	(auch der sozialen und gesellschaftlichen Gesundheit) fällt. Verschiedene Gössen von Betrieben brauchen verschiedene Prozesse und organisatorische Strukturen um Gesundheit zu erreichen.

The farmers mainly agreed that farm size does not necessarily affect farm health, because that is a matter of managing the capacities and complexities (described as diversity, integrity and sustainability) of the farm. The goal is to have a good understanding of your own capacity and ability for managing complexity, and either increase own capacity or reduce system complexity so they are well matched.

However, the farmers agreed that farm size matters in the context of health in the wider agri-food system. Farm size was, along with family farming, linked to the concentration of ownership of farmland. The Austrian farmers, in particular, expressed a wish to increase the number of people living in rural areas and involved in a diversified agriculture. Farming was seen as having a strong influence on the social structure of rural regions, and smaller farming units could support many livelihoods and provide food for the region through direct marketing etc. However, some of the farmers disagreed that diversified farms were related to farm size rather than management. It was also pointed out that small-scale farms rely on a small-scale food distribution and retail system, which are not available to all farms. Changing the farm without changing the agri-food system will not make the farm system healthier.

Farmers mainly agreed that family farms are not necessarily healthier. Farm health depends more upon engagement with the farm, and it is possible to hire managers and labour that share the same philosophy. However, family was seen as encouraging a longer-term view of farm health, when compared with a corporate entity whose primary goal is satisfying shareholders.

Statement 7

	From WSI	Final WSII
UK	Farmers who aim to run healthy farming systems select suitable and appropriate breeds and varieties to achieve multiple outcomes such as quality, optimum yield,	The main goals of farmers who aim to run healthy farming systems shift away from mass production towards quality production. Maximising (optimising) yields instead of

	resilience, animal welfare, biodiversity, etc.	maximising productivity (e.g. high performance breeds). By selecting suitable and appropriate breeds and varieties qualitative values and multiple outcomes such as quality, optimum yield, resilience, animal welfare, biodiversity, etc. can be achieved. High productivity when it comes to achieving multiple outcomes.
DE	Das Hauptziel von Landwirten, welche gesunde landwirtschaftliche Systeme bewirtschaften wollen, verlagert sich weg von der Massen-Produktion hin zur Qualitäts-Produktion.	Ein Hauptziel von Bauern und Bäuerinnen, die das Ziel haben, gesunde landwirtschaftliche Systeme zu bewirtschaften, verlagert sich weg von der Massen-Produktion hin zur Qualitäts-Produktion. Maximierung (Optimierung) der Erträge anstelle von Maximierung der Produktivität (wie z.B. mit Hochleistungsrassen etc.). Mit der Wahl von geeigneten und angepassten Rassen und Sorten können die qualitativen Werte und multiplen Ziele wie Qualität, optimale Erträge, Resilienz, Tierwohl, Biodiversität etc. erreicht werden. Hohe Produktivität beim Erreichen von multiplen Zielen.
AT	Das Hauptziel von Bauern und Bäuerinnen, welche gesunde landwirtschaftliche Systeme bewirtschaften, verlagert sich weg von Produktivität (z.B.: Fokus nur auf höheren Erträgen (kg), Hochleistungsrassen/-sorten etc.), hin zu anderen Werten wie Inhaltsstoffe der Lebensmittel oder artgerechte Tierhaltung.	

The farmers were very critical of the formulations from the national workshops and found them to be either misrepresenting organic farmers as unproductive in the Austrian statement, or focusing too much upon the means of health (choice of breed/variety) and neglecting the desired outcomes (i.e. food quality, animal welfare, etc.) from the UK statement. There was agreement that “productivity” is a problematic term in organic because it is too much linked to yield and economic value, and does not reflect the many other ways in which an organic farm is productive. The German formulation of shifting away from “mass production” was considered more acceptable, but still problematic because it also focuses upon yield and economic value. The farmers jointly agreed on the new statement, combining their most favourable formulations.

Statement 8

	From WSI	Final WSII
UK	Farmers who have been certified organic for a longer time, continue to improve health in annual growing cycles while evolving a broader view of their system; improving health by incorporating longer term structures on their farm (changes like longer rotations, perennials, habitats, hedges, trees etc.).	Farmers who aim to run healthy farming systems improve health by planning in an increasingly broad and long-term perspective of the system. For example through long rotations, perennials, habitats for wild animals, hedges, trees, (generational-structure/thinking), etc.).
DE	Landwirte, die das Ziel haben, gesunde landwirtschaftliche Systeme zu bewirtschaften, verbessern die Gesundheit	Bauern und Bäuerinnen, die das Ziel haben, gesunde landwirtschaftliche Systeme zu bewirtschaften, verbessern die Gesundheit

	durch die Planung in einer weiten/langfristigen Sichtweise des Systems. Zum Beispiel mit der Verbesserung der Gesundheit durch das Einbauen von langjährigen Strukturen auf ihrem Hof (z.B.: Mehrjährige Kulturen, Habitate für Wildtiere, Hecken, Hochstamm Bäume etc.).	durch die Planung mit einer zunehmend weitensichtigen/langfristigen Perspektive des Systems. Zum Beispiel mit weiten Fruchtfolgen, mehrjährigen Kulturen, Habitate für Wildtiere, Hecken, Hochstamm Bäumen, (denken in einer Generationenstruktur).
AT	Bauern und Bäuerinnen, welche schon längere Zeit nach ökologischen Richtlinien arbeiten, neigen dazu, ihren Schwerpunkt der Verbesserung der Gesundheit von kurzfristiger/einjähriger Planung zu einer weiteren/langfristigen Sichtweise des Systems zu verlagern. Zum Beispiel mit der Verbesserung der Gesundheit durch das Einbauen von langjährigen Strukturen auf ihrem Hof (z.B.: Mehrjährige Kulturen, Habitate für Wildtiere, Hecken, Hochstamm Bäume etc.).	

There was a great deal of disagreement as to how important this point is. Some of the farmers thought it is unnecessary and is highly related to other statements. For example, it is strongly linked to the Statement 1, due to the need to develop and maintain intuition in the face of changing circumstances. Intuition and the ability to respond appropriately was seen as more crucial than the development of a long term plan, which would most likely not take into account changes in climate, market or policy.

On the other hand, several of the farmers felt that the learning experience was important to emphasise. It was pointed out that neither in terms of experience nor economic investment could a farm in conversion afford to install long-term structures. Implementing long-term plans immediately might even jeopardise the conversion process. They also referred to farmers in conversion from conventional farming and their need to learn to think in increasingly long cycles as is necessary in organic. This was seen as a necessary process that farmers have to go through and the new statement was agreed upon.

Statement 9

	From WSI	Final WSII
UK	Farmers who aim to run healthy farming systems aim to communicate with and involve customers/consumers/retailers/processors to get across the story and value of the product and the farm.	Farmers who aim to run healthy farming systems are aware that they not only contribute to human health through their high quality products (food), but that they also deliver highly valuable outputs in other areas (e.g. environment protection, public goods, cultural landscape, water quality, etc.). They get across the story and value of the product and the farm through close communication with, and involvement of

		customers, consumers, retailers, processors, etc.
DE	Landwirte, die das Ziel haben, gesunde landwirtschaftliche Systeme zu bewirtschaften, brauchen das Bewusstsein, dass sie nicht nur durch ihre qualitativ hochwertigen Produkte (Nahrungsmittel) zur menschlichen Gesundheit beitragen, sondern dass sie auch in anderen Bereichen wichtige Beiträge leisten (z.B.: durch die Schonung der Umwelt, öffentliche Güter etc.).	Bauern und Bäuerinnen, die das Ziel haben, gesunde landwirtschaftliche Systeme zu bewirtschaften, haben das Bewusstsein, dass sie nicht nur durch ihre qualitativ hochwertigen Produkte (Nahrungsmittel) zur menschlichen Gesundheit beitragen, sondern dass sie auch in anderen Bereichen wichtige Beiträge leisten (z.B.: durch die Schonung der Umwelt, öffentliche Güter, Kulturlandschaft, Wasserqualität, etc.). Die Geschichte und der Wert der Produkte und des Betriebs (Systems) wird durch die direkte Kommunikation und Kollaboration mit Konsumenten, Kunden, Verarbeitern oder Händlern weitergegeben/erklärt.
AT	Bauern und Bäuerinnen, welche gesunde landwirtschaftliche Systeme bewirtschaften, brauchen eine ent-konditionierung ihres ‚Am Markt Denkens‘, die Lebensgeschichte der Produkte muss mit verkauft werden (z.B.: Kulturlandschaft).	

The farmers debated whether or not this statement ought to focus upon farmers' awareness of the public goods he/she produces, or the communication of these public goods to their customers. It can be hard for farmers to notice or measure the different public goods they produce because it is a 'normal' output for them. For example, it was remarked that organic farmers don't produce for the sake of the product, but rather for maintaining the cultural landscape, for sustainability and environmental reasons. In this case, it was seen as important to recognise that the public goods produced by organic farming often benefit others (or society in general) financially (such as the tourism industry), but not directly only the farmers themselves. It was seen as important to be aware of the public goods you are producing as an organic farmer because knowing your products are worth more makes you stronger.

On the other hand, it was also seen as important that consumers become more aware of the public goods provided by organic farmers, and that price/kg was not necessarily a good way of communicating this. Being able to communicate, and sell the full value of the product was described as the final hurdle facing a healthy farming system. However, it was also emphasised that this communication was an added burden upon organic farmers, and that other interest groups such as environmental agencies could do more to support this communication.

Statement 10

	From WSI	Final WSII
UK	Farmers are not sufficiently equipped with tools and methods to assess and measure their health contribution in other aspects of their system's outputs (e.g. public goods like water and air quality, environment and landscape, biodiversity, etc.).	N/A
DE	Landwirte brauchen geeignete Werkzeuge oder Methoden um den Gesundheitsbeitrag	N/A

	des Hofes als Ganzes, oder weitere ‚Outputs‘ ihres landwirtschaftlichen Systems zu bewerten und zu messen.	
AT	Bauern und Bäuerinnen brauchen geeignete Werkzeuge oder Methoden um den Gesundheitsbeitrag des Hofes als gesamtes System, oder weitere ‚Outputs‘ ihres landwirtschaftlichen Systems zu bewerten oder zu messen.	

This statement was discussed briefly and agreed by the group that it is, although very important, not a necessary point for this list, or for the purpose and aim of this list of health statements. It was therefore jointly decided to remove it from the final list.

Statement 11

	From WSI	Final WSII
UK	<p>The first and most apparent indicators of health on the farm are:</p> <ul style="list-style-type: none"> - Soil fertility - Soil workability - Biodiversity - Health of people on the farm - Yields - economic value of products - number of veterinarian visits and treatments, use of antibiotics/wormer/ medicine - external inputs - weeds, pests and diseases <p>Less apparent, more difficult to measure and monitor indicators of health include:</p> <ul style="list-style-type: none"> - food quality - Environmental impact (erosion etc.) - economic resilience - relationship with the local community - customer satisfaction - animal welfare/mortality rates 	<p>The first and most apparent indicators of health on the farm are (in alphabetical order):</p> <ul style="list-style-type: none"> - Biodiversity - Economic sustainability (financial viability) - External inputs - Food quality - Health of people on the farm - Number of veterinarian visits and treatments, use of antibiotics/wormer/ medicine - Plant vitality - Soil fertility - Soil workability - Weeds, pests and diseases - Yield
DE	<p>Die ersten und sichtbarsten Indikatoren von Gesundheit auf dem Hof sind:</p> <ul style="list-style-type: none"> - Bodenfruchtbarkeit - Boden-bearbeitbarkeit - Pflanzenkrankheits- und Unkrautdruck - Biodiversität - Gesundheit der Menschen auf dem Hof - Ernte - Anzahl von Tierarzt Besuchen - Anzahl von Antibiotika/Entwurmungs-Behandlungen - Einsatz fremder Betriebsmittel 	<p>Die ersten und sichtbarsten Indikatoren von Gesundheit auf dem Hof sind (alphabetisch):</p> <ul style="list-style-type: none"> - Anzahl von Tierarzt Besuchen und Behandlungen mit Antibiotika/Entwurmungsmitteln - Biodiversität - Bodenbearbeitbarkeit - Bodenfruchtbarkeit - Einsatz fremder Betriebsmittel - Ertrag - Gesundheit der Menschen auf dem Hof - Lebensmittelqualität - Ökonomische Nachhaltigkeit (finanzielle, wirtschaftliche Tragfähigkeit) - Pflanzenkrankheits- und Unkrautdruck - Pflanzenvitalität
AT	<p>Die ersten und sichtbarsten Indikatoren von Gesundheit auf dem Hof:</p> <ul style="list-style-type: none"> - Bodenfruchtbarkeit - Boden-bearbeitbarkeit - Biodiversität 	

	<ul style="list-style-type: none"> - Gesundheit der Menschen auf dem Hof - Ernte - Anzahl der Tierarzt Besuche - Anzahl von Antibiotika/Entwurmungs- Behandlungen - Externe Einträge 	
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The farmers discussed how much emphasis should be placed upon economic value and farm profitability as indicators of health. It was clear to all participants that a farm must have an economic means of surviving, and that a reasonable return on what is being produced was an indicator of this. However, the farmers also felt that this depended upon many external factors, including the economic model within which the farm operates. Alternative economic models might also allow the farm to survive without that being reflected in the economic value of the product. Plant vitality was emphasised as a ready indicator of farm health. This was seen as a separate point from product health. Observing how a plant is growing can provide vital information about the health of the soil and also provides a basis for product health as well as financial return. This was linked to the well-known organic approach that *“healthy soil means healthy plants, animals and humans”* (German farmer, translated).

Reflections on the international farmer workshop

The workshop was carried out in both languages English and German, and was translated by the research team “on the fly”. This was communicated to all participants well ahead of the event and seen as necessity to enable meaningful in-depth discussions of the sometimes abstract concepts across language barriers. This meant that some participating farmers could not discuss with one another directly, and required the discussion to be heavily structured and moderated. Some discussion points were undoubtedly lost due to the need to translate.

However, the participating farmers were able to ask for clarifications and explanations, and were able to express themselves in their native language and did so comfortably. They showed a great deal of engagement and interest in understanding the meaning and opinions of the other participants. The challenges and limitations of this form of translated workshop were made up for by the diversity of opinions and thoroughness of discussion achieved by including farmers from different regions, farm types, ages and genders.

3.3.4 International workshop with scientific expert group

At the international workshop with scientific experts, the statements were defined and presented as farmer-created, farmer-owned statements. Because not all farmer participants were able to be present at this workshop, the intent was not to analyse specific wording and formulations and go through and change or try to further improve each statement. Instead, the scientists were simply asked for their first impressions and feedback to the content and underlying meaning/message of each statement. This manifested itself into what was unclear, what seemed incomplete, what was interesting and what needed further research/verification/validation. These first impressions were briefly discussed - the discussion topics are represented below under ‘Discussion Comments’ - but were captured more completely in the form of post-it notes, as each person was asked to write down their first impressions with one impression per post-it note. These were later organised by

statement number and photographed. These photos were then transcribed here - under 'Post-it Comments' - to show how they might influence the further development of these *farmer health statements*.

For this session of the workshop, the 10 statements were grouped and ordered in a different way to reflect 'aims' of the different statements. The first group represented the three statements that were addressing primarily the farm system 'internally': **statement 2** (soil), **statement 3** (biodiversity) and **statement 4** (working with nature's systems and including all domains according to their needs). The second group represented the three statements that could be seen to primarily address the farmer: **statement 5** (observe key health-related processes), **statement 1** (intuition and awareness) and **statement 6** (ensure manageability and overview). And the third group represented the three statements that could primarily relate to the 'external' farm system: **statement 8** (long-term perspective), **statement 7** (shift in values) and **statement 9** (deliver public goods). And **statement 10** (indicators of health) was presented separately in the end.

The statements were shown in these three groups for the presentation during the workshop. The following discussion comments and post-it notes might therefore overlap between the different statements in each group below. A similar new order of statements was taken over also for the development of the final guidance brochure.

Statement 1

Discussion Comments:

- UK Farmer: the farmer is the self-consciousness of the farm: This is a bit odd for me; the farmer is the custodian or is aware of the farms' needs. Need for appropriateness.
- Scientist: ability for development. Farming system has to be active not only reactive. To react on external facts.

Post-it Comments:

- How to measure? No need to measure, quantitatively, social sciences.
- 5 of the 10 statements refer to 'self-observation' 'awareness' 'recognising' etc. So is a 'healthy farm' defined by an aware farmer?
- Why is health important for the farmer?
- This seems to be an umbrella principle, should it be recognised as that? In Frankfurt it was determined as an overarching principle.
- 'Farm' is the farm an entity? An organism? A self?
- Ecosystems have boundaries; this could help to name what a farm is.
- 'Intuition' 'gut feeling' 'soul-level' need clarification
- Observations can be tracked
- Observation is a scientific method, so literature on this may be useful
- Self-consciousness or the cultural gap needs to be transferred into this so that it is understandable during dissemination

Statement 2

Discussion Comments:

- Scientist: all of the biodiversity that you can see (biodiversity, soils) there is a lot more to biodiversity than what you can see
- AT Farmer: the good thing about such a limited list is that you can imagine doing it

- UK Farmer: we were thinking about how we will transfer the list of indicators; there are lots of ways to do that, but as a farmer, am I going to do those? Probably not. I'm a farmer, not a researcher. I want to be able to have 4 things where I go out and say, there is more of those, more of those, and those and those - so I must be doing it right. Rather than, hang on, I need a researcher, send her over there.
- Scientist: Sometimes I think we just get obsessed by the cuddly bits of biodiversity, what we can see rather than what we can't see.

Post-it Comments:

- 'Aware that soil health is fundamental' by means of knowledge?
- Can soil health be given dimensions and proven, measured, established?
- Need for a specification of indicators, as 'soil fertility' is not a measurable indicator but replies to a complex phenomenon.
- 'Soil health' what applicable indicators really describe the state of soil health?
- There is need for a toolbox for knowing what a healthy soil might be

Statement 3

Discussion Comments:

- How is the unit of 'farm' defined, because many farms don't have all domains present, but they are close to others that do, or they share with others close by and collectively cover all of the domains.
- Scientist: The unit is the farm, but not only the farm. There is a need to view a farm at another spatial level, a higher level, the farm is not the only possible observational unit, and even if the individual farm might not look so healthy, at another level you might find that it seems more healthy because its exchange with other farms in collaboration with the other farms. And this challenges the principle of health, is this really only relates to the principle of health on one farm, or can the standards be applied to a group of farmers?
- Scientist: I think that we are talking about systems, not units.
- Scientist: The term 'needs' doesn't it need to be picked up upon? Each farm has a different set or amount of needs, and the needs need to be identified and agreed upon.
- Scientist: long-term objective...we are interested in healthy food for healthy people, but the only principle that deals with that is number 7, but I think we should avoid that and focus on the primary production. I don't see any scale or constant of how things are measured and that makes it difficult for me to move forward. Apart from measuring biodiversity.

Post-it Comments:

- 'Changes in biodiversity' 'closely observed' —measuring biodiversity is currently driven by professional 'scientists'. This statement would be improved if we could pin down how biodiversity would be measured. There is an opportunity to develop and agree on approaches of measuring biodiversity.
- 'High and increasing biodiversity' this is rather loose. (More pests? More weeds?)
- Biodiversity in a disease isn't what we need
- Opportunity to work with wildlife conservationists on farmland for monitoring
- Practicality of monitoring
- The statements imply that 'high' biodiversity is good or better. This brings in a relational aspect. How far? Until when? What are the dimensions? This does not fit within ecosystem understanding?

- 'Biodiversity' or 'agro-biodiversity'? Needs to embody the idea of diversity in crops or animals.
- I suggest the consideration made between planned and associate biodiversity. Planned: the farmer managed diversity, rotation, intercropping, cover crops, mixed livestock, etc. Associate biodiversity: derived from planned diversity and the non-cultivated ecosystem on the farm or surrounding the farm. This makes it more active, right now it is rather passive.

Statement 4

Post-it Comments:

- How are the 'needs' defined?
- Who identifies the 'needs'? How?
- Who agrees on the 'needs'? Is there agreement for needs?
- What about changing 'needs'? Needs (may) change over time
- 'Agro-ecosystem'- what about other factors? Water, air, ...?
- What are 'natural lands' 'natural systems'?
- Does soil really have 'needs'? Or do the needs arise from our using the soil for specific purposes?
- Nutrient balances on the soil in a farm and farm level have to be considered.

Statement 5

Post-it Comments:

- How can we measure the practice of each point?
- Simple educational tools in multiple languages or 'non-verbal' versions to recognise and/or evaluate aspects of health
- Indicators of 'health'
- If the aim is to make health judgment measurable and improvable then easy to use indicators are required
- Different health related parameters are not visible, but need to be observed (e.g. nutrient mining) but also effects on the health of the environment (e.g. emissions)
- What is a testable hypothesis? Null hypothesis is subject to 'proper scientific research'
- How many of the statements are supported by specific methods for measurement-metrics that can be estimated by the farmer/manager?
- Identify what can be measured in terms of health
- How can we describe 'constant change' or development?

Statement 6

Discussion Comments:

- Scientist: I think these three are all good together. A point for the last one, focusing on complexity and size but also appropriate in scope. We shouldn't grow cereals on some types of farmland. No matter how big the farm is it may be inappropriate for the farm to be doing this. It is embodying decisions of the moment, so there might be an external forces built in here, it isn't all about on farm, climate farm.
- AT Farmer: are we talking about resilience of the system or things we think might happen in the future? We can find points to make a system more resilient but we can't find points of the future.

- Scientist: The context is missing...the context is that we want a healthy society looking after a healthy planet. And this context influences these points. I feel like we are dancing around this context in each principle, I am not sure if we should avoid talking about this, even if we want to focus on the primary production.

Post-it Comments:

- Manageability vs. size/complexities
- Development of farmers' ability is key to be able to judge what is achieved and achievable
- How do 'diversity' 'integrity' and 'sustainability' relate to 'processes'?
- What does it mean to organise 'capacities'?
- Also, the statements '...to achieve health' which implies that health is understood

Statement 7

Post-it Comments:

- Delete 'maximising'
- Long-term planning must deal with succession and financial viability
- The formulation of 'away from' and 'mass production' do not seem appropriate.
- We should not define ourselves by describing what we are not.

Statement 8

Post-it Comments:

- 'Appropriateness' of a practice or a system to a location's character
- SCALE - how do these principles scale-up?
- What is meant by 'broad'?
- How long is 'long-term'? Are we thinking in generational terms?
- Why 'increasingly'? With no apparent end-point?

Statement 9

Discussion Comments:

- Scientist: what do you mean by quality?
- Scientist: I have big problems with this terminology, mass production those phrases are difficult. Whereas qualitative values and multiple outcomes are perhaps more useful
- Scientist: What I miss in the statements is the economic sustainability. When I work with farmers, they need to have a healthy economic return before they can even think or focus on implementing these things.
- DE Farmer: I think we should take the maximising out and put in optimising, that encompasses much more of what we are doing than maximising

Post-it Comments:

- What is food quality?
- How does this statement relate to the title? It does not appear to fit.
- Also maybe include 'meaningful work' in the list.
- Is the transparency of the production system part of health?

Statement 10

Post-it Comments:

- Missing: Economic sustainability

- Financial viability must be included, surely! Or is it implicit, I think it should be explicit.

Miscellaneous Comments

Post-it Comments dealing with the project in general and its scope:

- What does it mean to be a healthy farm, or healthy farming system?
- The context of the whole process - we have to face up to it!
- What is health? - a balance of nutrition or feeding the world?
- Holistic approaches in agricultural education at different levels, which requires fundamental reform
- Extend the scope to the food chain or food system
- How to define 'healthy foods'?
- Is it really true that organic food is beneficial to human health?
- In general the exclusion of the wider socio-economic context is a weakness
- Socio-economic and political economy cannot be excluded. In points 4-6 it is essential to have awareness of the potential for innovation or change and awareness of the external forces that will impact farm health.
- What is a farm and what is healthy? Can this be defined and/or described?

Post-it Comments dealing with the specifics of statements:

- If the statements use or arise from a systems understanding, then I am surprised (I missed that) that feedback loops are not mentioned, that statements were not steady into eternity but are shifting.
- Terms I would have expected as relevant:
 - Adaptability / resilience, functionality
 - Coherence
 - Health as a dynamic concept, an ability to adapt
- Should number 5 and number 1 be merged?

Reflection on international workshop with scientists

There were many questions about definitions and clarification of terms, as well as ideas about what might be left out. Questions of overall goals as well as fundamental questions of what is health and how is it important to farmers were asked. The topic of measuring and metrics was also common throughout each statement. How can, what was said to be important for farm health, be measured? This begs the question is measuring the only way to understand if a system is healthy? Observation was also noted as a scientific method that was mentioned in many statements.

3.3.5 Identified research needs during international workshop with scientists

The table below shows the list of initial research needs emerging during the international workshop with scientists. As a last step during the workshop, all participants were asked to collect ideas for next steps and specific research questions that they want to address, based on the discussions around the 10 health statements. They were asked to write down a list of project ideas (they produced 25), the full list can be seen in annex E), which were then jointly rated, grouped where adequate and voted on by all participants. Once these high-priority areas were determined, the

participants were asked to split up in groups and join further development discussions of one or two of the subjects they were most interested in, or where they believed they could contribute the most. The groups were also asked to identify what ‘needs’ the individual projects might have, e.g. the collaboration with other experts or organisations outside of the group; as well as to identify potential funding streams that could be suitable for each project ideas. The table below shows the list of the seven project ideas that received the highest number of votes by the interdisciplinary and international group of workshop participants, and the initial idea description developed in thematic groups.

Table 3: Identified research needs, first project idea descriptions

Project title	Project description
Testing and communicating the health statements	Clarify the meaning of the statements, bring them into different milieus and test them with different audiences: evaluate if common understanding is there and where the difficulties lie (discussions seminars, involvement of consumers/processors/children and students...). Set-up farmer-to-farmer learning groups, farmer support groups and best practice networks; communication about what health is (e.g. soil life, soil health).
Co-developing new metrics to assess health in (organic) farming systems	Identify what is ‘transferred’ from soil to plant to animal to human, and show health links in a whole farm-system research approach. Develop new methods (context and scope dependent) to measure these ‘health links’; co-develop metrics in this particular group and network for health assessments that are helpful for farmers and researchers.
Farmer coaching scheme for the (sense-) development of intuition	Develop a coaching scheme for senses development, how to develop intuition; raise the sensitivity and awareness of farmers for statement nr 1 (intuition, self-awareness, observation). Objectively assess the meaning on farms and for the farmer; what are the aims and individual goals. Learning the language of nature, get a feel for the farm and processes. Use a farmer to farmer learning approach and develop a health checklist.
Participatory research on health in organic farming systems, linking practice experience with scientific evidence	Jointly develop and link scientific evidence and experience from practice (using the experience from practice and search evidence with scientific approaches). Use action- and participatory research approaches for whole farm-system development. E.g. linking into existing projects on biodiversity – what can the statements add to them?
Developing appropriate methods for financial viability assessment of individual farms.	Define what financial viability of a farm is, who measures it and on which level or scope it needs to be measured. Develop appropriate assessment methods for individual and bottom-up evaluation (What do I need to consider my farming system or business viable?)
Evaluating the relationship of the health statements to conventional farming	Evaluate the relationship of the health statements to conventional farming, which parts are distinctive to organic farming? (Raising needs to clarify?) E.g. seeing farm as an organism.
Jointly organise OWC2017 workshop	Jointly organise an IFOAM workshop on this work at OWC2017 in India.

The aim now is to take these project ideas forward by their individual subject-groups (all groups ended up being interdisciplinary, with farmers and scientists well spread out) over the following months.

4. Discussion and conclusions

As one of the main outputs of this work, the guidance brochure describes the project results of the international farmer group, presenting their own key-statements of health in organic agricultural systems. During the process of their development, and especially after their presentation and discussion with scientists during the final project workshop, it became clear that the statements, as formulated by the 16 farmers, require some more clarification and particularly testing and validation by a broader group of farmers in practice. Only this would allow them to be communicated as final and 'universal principles of health in organic farming'. However, the farmers of this project took very clear ownership and finally identified themselves strongly with these ten statements, seeing them as their own principles of health.

One Austrian farmer concluded during the finalisation of the guidance brochure (translated): *"These living principles were formed out of a creatively enriching farmer group, they are very well matured and all farmers that were present are behind the wording and formulations. I do not have the impression that the scientists who were present during the final workshop can fully share this vitality with us farmers (and they don't have to, they are scientists and not philosophers!)."* Another German farmer stated during the final workshop: *"The most interesting thing for me is, that these 16 farmers have been able to talk about these things and to write them down. Now there is a 'collision' with the scientists, who cannot understand some of these points. They are discussing if a statement is right or wrong, and 'what does it mean?' and 'what can we do with it?'. For me, these statements are there now, as they are, as said by the farmers, and they are very important. This refers to the concept of "Erfahrungswissenschaft", the 'science of experience' and that actually farmers are the ones who develop questions for science, very strongly connected to their experience. And as the statements were developed here, to me it means that farmers see themselves in a process of being more and more aware, looking at things differently and gain more knowledge and experience. So this is a completely floating experience 'thing' and it is nothing that you can tear apart or build a thesis around it."*

The project team has therefore decided to produce this guidance brochure in the shape and form as it is now available, in the farmers words, with the aim to provide a base and starting point for future project work, which will refine and validate these highly valuable farmer principles with a broader range of international farmers, to enable the general and universal application of these principles in European organic farming.

The discussions during the final workshop of the project also made clear, that the ten health statements and their validation for a wider application, need to be 'rolled-out' very carefully and slowly, step by step; first in smaller groups of farmers, understanding and testing the principles in practice, and then steadily expanded to a wider group and other stakeholders. One scientist stated during the final workshop: *"I think it is very important to connect with official organic movement representatives for this. But at the same time, I feel there is, as with every movement and sub movement, a certain risk involved. If you roll this out, if you expand it, it will be diluted as you include more people. Because in the end, the original principles that were identified here, might lose*

their value if they are shared with so many new people, with completely different ideas and interpretations of what the principles might mean; diluting their idea and perhaps their power.”

This project had set out to increase the collaboration and networking among farmers and scientists to jointly think about and create new, more holistic approaches to health measurement and health research in ecological agriculture. The newly established research needs and project ideas from the final workshop are seen as the successful first step of developing this interdisciplinary network of farmers and scientists to jointly design such improved approaches. Through the identification of farmer's own principles of health (in their own words and language), the project has provided a sound basis for such new 'thinking-patterns' and was able to stimulate and inspire a wide range of farmers and scientists to review and challenge their own philosophies and sometimes unconscious perspectives of health. The collaboration between farmer groups from different countries was particularly fruitful, as the exchange and detailed discussion, comparison and matching of their own personal points of view with colleagues in the same country, but also with those from different countries, from different backgrounds and farming environments, was seen as highly inspiring and thought-provoking.

5. Publications created by the project

Below is a list of project outputs and publications, both completed and planned for the near future:

- Vieweger A, Bloch R, Klimek M, Bachinger J, Döring TF (2016) *Was macht einen gesunden Landwirtschaftsbetrieb aus? – Zum Prinzip Gesundheit in der ökologischen Landwirtschaft*. Lebendige Erde 3/16: 30-32.
- Vieweger, A (2015) *Best Practice Network for health in agricultural systems*. ORC Bulletin, autumn 2015.
- Döring, TF (2015) *Resilient and healthy organic farming systems – concepts, measurements and applications*. EPOK Seminar, Research for sustainable organic farming – System perspectives, stakeholder cooperation and communication, Stockholm, 9 December 2015.
- Vieweger A, Döring, TF, Bloch R, Bachinger J, Klimek M, Paxton R and Woodward L (paper accepted) *Das Prinzip der Gesundheit als Leitmotiv des Handelns in der betrieblichen Praxis*. [Submitted to 14. Wissenschaftstagung Ökologischer Landbau, 7-10 March 2017, Freising-Weihenstephan, Germany].
- Paxton R, Klimek M, Vieweger A, Döring, TF, Bloch R, Bachinger J and Woodward L (paper under review) *The Role of Intuition in Managing Organic Farm System Health*. [Submitted to 5th ISOFAR Scientific Conference “Innovative Research for Organic 3.0” at the 19th IFOAM Organic World Congress, 9-11 November 2017, New Delhi, India].
- Vieweger A, Döring, TF, Bloch R, Bachinger J, Klimek M, Paxton R and Woodward L (paper under review) *The IFOAM principle of health – how do organic farmers apply it in practice?* [Submitted to 5th ISOFAR Scientific Conference “Innovative Research for Organic 3.0” at the 19th IFOAM Organic World Congress, 9-11 November 2017, New Delhi, India].
- Paxton R, Klimek M, Vieweger A, Döring, TF, Bloch R, Bachinger J and Woodward L (paper in progress) *From intuition to strategy: Farmer to farmer strategies for managing healthy farm systems*. Journal tbc.
- Döring, TF, Vieweger A, Bloch R, Paxton R, Klimek M, Bachinger J and Woodward L (paper planned on “Participatory approach to farmer principle development, methods of farmer engagement to identify best practice in healthy agricultural systems”). Journal tbc.

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Annex

Annex A - Example agenda of the UK national workshop

Annex B - Agenda of international workshop with best practice farmers

Annex C - Agenda of international workshop with scientists

Annex D - Online survey questionnaire (English version)

Annex E – List of ideas for potential next steps / research needs and questions collected by the participants of the international workshop with scientists

Annex A - Example agenda of the UK national workshop

Developing best practice networks of health in organic agricultural systems

National meeting of Best Practice Example Farmers

26th and 27th November 2015

held at Abbey Home Farm, Burford Road, Cirencester, Gloucestershire, GL7 5HF, UK

Agenda for workshop I

Thursday, 26 November

- 10.00 *Arrival, Tea and Coffee*
- 10.30 – 12.30 **Introduction and background of the project**
Where do we come from: presentation of the ideas and project-work so far (Health I and Health II projects) (incl. introduction to the IFOAM principles and the principle of health); aims of HealthNetworks project, and the aims of the workshop/best practice groups.
- 12.30 – 13.30 *Lunch*
- 13.30 – 15.00 **Best practice working group UK**
Introduction of host farm (20 minutes) and then visit of healthy 'areas' of the farm: seeing the health aspects in practice (1 hour).
- 15.00 – 15.30 *Coffee/Tea*
- 15.30 – 17.30 The other four working group partners give a short presentation on their background, description of his/her agricultural system and one key-health experience on their farm (what makes their system healthy?) 20 minutes each, plus questions.
- 18.30 *Dinner*
-

Friday, 27 November

- 9.00 – 11.00 **Presentation of survey results and summarised key statements (strategies)**
Discussion of the 10 statements and identification of new strategies if relevant. Discussing commonalities and their transferability to other farms.
- 11.00 – 11.30 *Coffee/Tea*
- 11.30 – 13.00 **Identification of farmer principles of health (key strategic practices)**
What are the individual visions and philosophies regarding farm system health, defining farmer's own principles after which they work day-by-day to increase health. Are there commonalities? These strategic practices will be grouped to the strategies identified earlier.
- 13.00 – 14.00 *Lunch*
- 14.00 – 16.00 **Conclusions and way forward**
Finalising overview (table) and prioritisation of key strategies and practices that could be transferred to other organic farmers and/or other systems. Identification of guidelines and recommendations? Ranking of importance and relevance. Outlook and plans for workshop II in Germany.

Annex B - Agenda of international workshop with best practice farmers

Developing best practice networks of health in organic agricultural systems

International meeting of Best Practice Example Farmers

22nd and 23rd February 2016

held at K-Eins-A Conference Venue, Kasselerstrasse 1a, 60486 Frankfurt am Main, Germany

Agenda

Monday, 22 February

- 12.00 *Joint lunch at the conference venue*
- 13.15 – 14.00 **Welcome and introductions**
- 14.00 – 15.30 **Workshop aims and presentation of the individual group results**
Agreement on what we want to achieve in this meeting and presentation of the outcomes of the three national workshops held during November 2015, highlighting commonalities and differences in the identified key statements.
- 15.30 – 16.00 *Coffee/Tea*
- 16.00 – 18.00 **Agreement of a set of general key-strategies (recommendations)**
Discussion of which statements can be 'merged' and are transferable to other farmers and other countries; and which ones are not, which areas are country-specific and need to be kept as such.
- 19.00 – 21.30 *Joint dinner at Weinkontor Frankfurt, Schlosstrasse 92*

Staying at Hotel National, Baseler Str. 50, 60329 Frankfurt am Main (very close to the main station – Frankfurt Hauptbahnhof)

Tuesday, 23 February

- 9.00 – 11.00 **Identification of key strategic methods (how do we achieve these key-strategies?)**
Discussion of methods and approaches that the farmers use to reach or fulfil the identified common strategies/recommendations; what can others learn from them, formulation of practical instructions on how to achieve these goals.
- 11.00 – 11.30 *Coffee/Tea*
- 11.30 – 13.00 **Finalisation of key strategies and their key strategic methods, future outlook**
Agreement on the final version of key strategies and correlating strategic methods on how to reach them; discussion of the future plans and next steps of the project, further ideas.
- 13.00 – 14.00 *Joint lunch at the conference venue
and End of Workshop*

Additional information about the workshop organisation and structure

The presentations will be held in both languages. Please have a good look at the documents before the meeting; we hope this will clarify discussions and aims of the workshop.

The discussions will be translated by Thomas Döring and Anja Vieweger; please be aware that therefore progress might be slower and we kindly ask you bring bucket loads of patience with you!

Here a couple of sentences to further explain the agenda:

The aim of the meeting is to find a certain consensus among the different international farmer groups with regards to which health principles for organic agriculture they are working with, and how they should be formulated and interpreted. These principles should be identified on one hand on a strategic level, as strategies, describing broader *visions* or *philosophies* that you aim for. And on the other hand, these strategies also need more specific methods, describing how these strategies can be addressed/ achieved in practice, on the field. These Methods should provide inspiration and clear instructions for other farmers aiming to increase the health of their agricultural system.

During the workshop we will have to separate these two terms clearly:

- First, we will (as far as possible) jointly agree the 10 **strategies** among the three farmer groups (each of these groups had formulated their 10 strategies in the November 2015 workshops)
- Secondly, we will jointly define a set of **methods** for each of these strategies, explaining how you personally and in practice achieve these strategies.

In the attached presentation you will find the translation of each slide into both languages, blue for English and black for German. You will find the 10 strategies in the second half of the document, where the three versions of the groups are listed as follows: Austrian text first, then the German version, then the UK version (the order represents the time succession of the workshops back in November). We will work with these 10 slides predominantly during the two sessions on Monday afternoon, where we hope to identify a common formulation (one that means the same in both languages).

Annex C - Agenda for international workshop with scientists

Developing best practice networks of health in organic agricultural systems

International and interdisciplinary workshop

19th and 20th September 2016

Leibniz Centre for Agricultural Landscape Research (ZALF), Eberswalder Str. 84, 15374 Müncheberg, DE

Agenda

Monday, 19 September

- From 13.00* *Arrival*
- 13.30 – 14.00 **Welcome and introductions** (Johann Bachinger and Ralf Bloch)
- 14.00 – 15.30 **Workshop aims, roles and tasks** (Anja Vieweger)
Outline of what we want to achieve in this meeting, agreement of agenda and structure of different tasks and objectives.
- The HealthNetworks project and its results so far** (Anja Vieweger and farmers)
Introduction to the project; outcomes of three national farmer workshops (Nov 2015), as well as an international workshop (Feb 2016); particularly including a presentation of the 10 key principles and strategies that the best practice farmers have identified to improve health in organic farming systems.
- 15.30 **Departure for farm visit at Hof Marienhöhe** (~45-minute drive in mini-busses)
Hof Marienhöhe is the oldest bio-dynamic farm in Germany, established in 1928 to demonstrate that the methods described in Rudolf Steiner's lectures of 1924 also work in this area of Germany. The farm walk will be hosted by one of the project's best practice farmers, Fridjof Albert. www.hofmarienhoehe.de
- 19.00 *Drive to Hotel Bergschlösschen*
- 19.45 *Joint dinner at Hotel Bergschlösschen*

Staying at Hotel Bergschlösschen, Königstraße 38, 15377 Buckow (<http://bergschloesschen.com>), Phone +49 (0)33433/57312

Tuesday, 20 September

- 8.30 *Transfer from Hotel to ZALF*
- 9.00 – 10.00 **Next steps for the farmer's principles:**
Publication and collaboration on existing project results (Milena Klimek)
- 10.00 – 11.00 **Identification of research gaps, demonstration needs and required actions for taking the key findings forward** (group discussions)
Brainstorming of challenges, opportunities and solutions, formulating ideas to take the different subjects further (e.g. as a research project, practice recommendation, advisory programme or any other suitable form or medium).
- 11.00 – 11.15 *Coffee/Tea*
- 11.15 – 12.15 **First ideas presentation**
The three groups present their ideas and potential proposals, followed by a joint prioritisation of approaches.
- 12.15 – 13.15 *Joint lunch at ZALF*
- 13.15 – 14.30 **Elaborate identified research, demonstration or action needs** (group discussions)
Teams are re-grouped based on interests and possible contribution of participants to certain ideas; to discuss and reshape the identified projects/subjects and formulate potential concrete actions for realisation which aim to demonstrate ambition, realism, innovation and commitment. (Collection of first thoughts on possible funding streams for the particular ideas/projects).
- 14.30 – 15.30 **What next?** (plenary discussion)
Presenting proposed solutions for group offers, identification of potential funding streams feedback and all participants decide on the specifics to be taken forward from the meeting.
- 15.30 **Review of workshop and next steps** (Anja Vieweger)
- 16.00 *End of Workshop*
-

Annex D - Online survey questionnaire (English version)

Developing best practice networks of health in organic agricultural systems

Questionnaire for the organic farmer and grower survey

Introduction

Many thanks for answering the following questions. We are very grateful for your valuable contributions! For our research project on health in agricultural systems, we would like to ask you about your personal experience and opinions on *how* and *why* your farm and its outputs are healthy or unhealthy. Please keep your whole farm system in mind, when answering the following 8 questions:

1. Please describe the type of your farm/holding by indicating your area/s of activities: [\(multiple choice from the list below\)](#)
 - Fruit
 - Vegetables (field and greenhouse/polytunnels)
 - Field vegetables (potatoes, cabbage, carrots etc.)
 - Arable
 - Mixed farm
 - Chickens
 - Dairy
 - Beef
 - Sheep and Goats
 - Other [\(open text box\)](#)
2. What is the size of your organically managed farm [in hectares]? [\(drop-down numbers to choose from 0-1; 1-5; 5-10; 10-50; 50-100; 100<\)](#)
3. How many years has your business been certified organic or biodynamic? [\(drop-down numbers to choose from for organic and biodynamic\)](#)
4. What is the main reason for you to farm/grow organically? Can you name a key-experience that influenced your decision? [\(open text box\)](#)
5. How did the health of your farm system change after you converted to organic? What particular examples do you recall? [\(options to choose from with attached open text boxes: after 2 years, after 5 years, after 10 years, after 15 years\)](#)
6. Please describe how you made your farm healthier over the years. [\(open text box\)](#)
7. Which outputs of your farm system are healthy and why? And which are not? [\(open text box\)](#)
8. Please rate how important the following aspects of a healthy farm/agricultural system are to you (1-5; 1=highly important, 5=not important): [\(each option to rate in a drop-down number 1-5\)](#)
 - Market and prices
 - Environment
 - Policy, regulations and standards
 - Family health
 - Biodiversity
 - Customer relationships
 - Plant health
 - Animal health and welfare
 - Productivity
 - Soil fertility
 - Personal health
 - Farm succession
9. If one comes to your mind, please nominate a farmer who you feel is highly successful in managing a healthy farming system, and explain why you nominate him/her: [\(open text box\)](#)

Thank you very much for contributing to our research project! If you would like to be informed about our work and results, or if you'd like to engage further in the project, please leave your name and contact details here: [\(open text box\)](#)

Annex E – List of ideas for potential next steps / research needs and questions, collected by the participants of the international workshop with scientists

No.	Project idea	Vote	Group
1	Identify what is 'transferred' from soil to plant to animal to human?	1	
2	Communication about what soil life, soil health is; among farmers, but also all other stakeholders, consumers etc.	4	
3	Whole farm-system research needed for showing links, develop new methods to measure these 'health links'	3	
4	Develop senses to develop intuition (5 senses, develop intuition)	3	
5	Farmer to farmer learning, farmer support groups, best practice networks (who should be mentor?)	1	
6	Clarify the meaning of the statements, add explanation of the statements	3	
7	Co-development of metrics for health assessments that are helpful for farmers and researchers	4	
8	Linking into existing projects on biodiversity – what can the statements add to them? (e.g. PG tool)	0	
9	What can the statements add to raising awareness of quantitative research	0	
10	What are the appropriate paths to communicate these results? Work first within the project group to establish plan	2	
11	Test the statements with different audiences, if common understanding is there and where the difficulties lie	2	
12	Raising the sensitivity and awareness of farmers for statement nr 1 (intuition); objective measuring on farms, and what does this mean for the farmer; what are the aims and individual goals (as a circle process before and after projects – reflection)	0	
13	Cycle of reflection is needed in all research approaches and projects taken forward from this	0	
14	Jointly organise an IFOAM workshop on this work at OWC2017	2	
15	Learning the language of nature, get a feel for the farm and what is going on. Develop a health checklist, coaching scheme	5	
16	Science of practice, also including social aspects, action and participatory research approaches – whole farm development	1	
17	Improve soft skills between farmers and researchers, circular process	0	
18	Metrics are context and scope dependent, which is a challenge and opportunity to jointly develop in this particular group and network	1	
19	Level of agreement; how easy was it finding agreement on the statements among the 15 farmers	0	Addr. in project
20	Need to leave the statements as they are, formulated by the farmers (ownership); and leave the questions open: how do we move on from here, what do we do with them? Need to find focus and clarity to take the statements further	0	
21	This impulse should be brought into different milieus (discussions seminars, involvement of consumers/processors/children and students...) and effects evaluated.	1	
22	Need to look at relationship to conventional farming, which parts are distinctive to organic farming? (Raising needs to clarify?) E.g. seeing farm as an organism.	2	
23	Jointly develop and link up scientific evidence and experience from practice; using the experience from practice and search evidence with scientific approaches, interaction in both ways	4	
24	Positive health approach, a soil is healthy when....	3	
25	Define what financial viability is? Probably needs to be defined on personal level? How much (how little) do we need to consider our own system or business viable? Appropriate methods needed for individual assessment.	2	