

A scenario analysis on the implementation of a farm animal welfare assessment system

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Abstract

There have been important developments in the measurement of farm animal welfare in recent years. Measuring animal welfare is one thing, implementing a farm animal welfare assessment system another. The implementation of such a system occurs in an environment that is influenced by economic, political, technological and socio-cultural factors which interact with each other. This creates enormous complexity, generates a huge number of different potential 'futures', and makes the eventual impact that the system will have on the welfare of farm animals uncertain. This article draws upon strategic management literature to apply scenario analysis as a technique to help understand the variance of the uncertainty associated with the implementation of an animal welfare assessment scheme. Specifically, it develops two extreme scenarios based on a theoretical European-wide implementation: one scenario in which all uncertain factors influence the implementation of the assessment system in a negative way, and one scenario in which all these factors have positive impacts. These scenarios provide insight into the variance of possible futures in which the system may have to function. Although consumers are an important stakeholder group, their role in creating uncertainty for the system may be overestimated; it is apparent that the roles of companies, brands and certification organisations deserve significant attention, as well as any relevant institutional structure.

Keywords: animal welfare, certification, farm animal welfare assessment, implementation, policy, scenario analysis

Introduction

Since the Second World War, major changes have taken place in animal production. Farming has become increasingly industrialised with intensification of production, new technologies being introduced to farmers, farms becoming highly specialised and significant increases in production and the number of animals per farm (cf Blokhuis 1998; Porcher 2001). During more recent years, the awareness of the general public for animal welfare and farming issues has grown and been affected by factors such as the activity of animal interest groups, as well as by media attention of animal health crises such as swine fever, BSE, and foot-and-mouth disease. In order to accommodate societal concerns about animal welfare issues, interest in animal food products — as well as related market demands — Government and academic research attention has focused on the development of reliable, science-based, on-farm systems for assessing animals' welfare status (cf Blokhuis *et al* 2003). In recent years, major steps have been made in the measurement of animal welfare (Bracke *et al* 2001; Blokhuis *et al* 2008) and assessment systems have been developed for several species of farm animals (Keeling 2009; Welfare Quality® 2009a,b,c; Blokhuis *et al* 2010).

Whereas developing an animal welfare assessment system is one thing, implementing these in production chains and marketing them in a way that connects farmers to processors, retailers and consumers as well as to the other stakeholders which affect the assessment system (for example governments and special interest groups) is another. In the implementation of animal welfare assessment systems, policy-makers consider (amongst other factors) the attitudes and economics of farmers (Den Ouden *et al* 1997; Bornett *et al* 2003), the perceptions of consumers (Bennett 1997; Bennett *et al* 2002; Frewer *et al* 2005), the role of certification bodies (Hatanaka *et al* 2005) and standard-formulating organisations (Ingenbleek *et al* 2007), the strategies of food companies and brands (Adams 2008), and structural developments in macro-economic and political environments such as international trade issues (Hobbs *et al* 2002). These factors do not combine in any simple way that can be easily 'managed', as interactions between all these factors lead to a huge number of potential future directions. Each of these different 'futures' will require a different type of support for the implementation of the assessment system.

This article aims to explore these potential futures by applying scenario analysis. Scenario analysis is a technique

used in strategic management to improve clarity. It involves the development of scenarios that describe different possible futures. Its objective is not to predict the future, but to gain a better insight into what the future may be like and which factors may be crucial to influence the future in a desired direction (Fahey & Randell 1998; Godet 2000).

In the remainder of this article, we first describe the different steps of the scenario development process. We then provide brief narrative descriptions of the resulting scenarios and, subsequently, we discuss the insights derived from these scenarios.

Materials and methods

Scenarios are “focused descriptions of fundamentally different futures presented in a coherent script-like or narrative fashion” (Schoemaker 1993; p 195). Scenario analysis is a strategic management tool which organisations can use to create a better understanding of potential ‘futures’. The method became popular after Royal Dutch/Shell had been able to anticipate the oil crisis in the 1970s on the basis of scenarios (de Geus 1988). According to Linneman and Klein (1983), in the early 1980s more than half the US Fortune 500 companies had adopted scenario techniques in their strategic management. An empirical study in two industries in the UK (the water industry and the information technology consulting industry) indicated that scenario analysis has a positive impact on financial performance (Phelps *et al* 2001).

Researchers can use a large number of research methods to provide insight into possible future developments. In the technological sciences alone, the Technology Futures Analysis Working Group (2004) lists over 50 strategic management research methods, ranging from interviews and stakeholder analysis to trend extrapolation and simulation. Scenario analysis, as it is used in this article (sometimes also referred to as the scenario planning method), is different from scenarios that are based on statistical simulations of uncertainties (Schoemaker 1993). The focus in studies like the one described in this paper is not on single-line forecasting, or on making precise predictions, but on better understanding future uncertainties. The method becomes more useful as phenomena become more complex and more uncertain. As compared to the Delphi-method which is frequently used in food policy research to systematically synthesise expert opinions about specific predictions (Henson 1997; Rikkonen 2005), scenario development is, for example, better equipped to identify strategic issues and to deal with problems that have a broad scope (Schoemaker 1993). In general, the method helps us to *learn* how the future ‘could be’, accepting its uncertainties and complexities. It thus helps to identify strategic issues that deserve attention in strategy or policy development.

Due to the increasing popularity of scenario analysis, a large number of tools, formats, frameworks and methodological descriptions have become available to those wanting to engage in scenario planning (eg Fahey & Randell 1998; Godet 2000). To develop scenarios we followed the steps suggested by Schoemaker (1993) who presents a generic,

synthesised, method for scenario construction in which the focus is on learning and exploring interrelationships among trends and key uncertainties. Since we are primarily concerned with understanding the potential variance in the future, we develop so-called ‘forced’ or ‘extreme’ scenarios (see Table 1). These are particularly helpful to understand the range of potential future directions and thus help to identify strategic issues.

Objective

As a first step, we defined the issue that we aimed to understand better — this was the implementation of the animal welfare assessment and information methodology that the Welfare Quality® (WQ) project has produced. WQ was a research programme co-financed by the EU Commission. One of its objectives was to design systems to assess the welfare of cattle, pigs and poultry on farms and at slaughter, and with the potential to translate these assessment data into information on animal welfare that is communicated in connection with a product (on the package or otherwise). The assessment is built (mainly) on animal-based measures collected on a given animal facility. The outcomes of these measures are used to create a score for each of 12 welfare criteria defined within WQ to cover different key aspects of animal welfare. Criteria scores are then used to calculate a score for each of four ‘welfare principles’: good feeding, good health, good housing and appropriate behaviour. These are then combined to produce an overall welfare assessment of the animal unit in the form of an assignment of one of four categories to that facility (eg ‘not classifiable’, ‘acceptable’, ‘enhanced’ and ‘excellent’). The different steps in this process are illustrated in Figure 1. The outputs from the four stages have different informational content, relevance and value and thus various potential uses. The possible users of the information at the different stages are also indicated in the figure.

The final results of the WQ project were delivered in 2009 and so the period that we explore in developing the scenarios is the subsequent timeperiod between approximately 2010 to 2015. Implementation is seen as an adoption process (Rogers 2003), in which stakeholders may favour, stimulate or adopt the use of the assessment methodology. Although the assessment methodology can in principle be used anywhere in the world, for the purposes of this study, the scope of the scenarios is restricted to the EU.

Identification of stakeholders

As a second step, the stakeholders relevant to the scenarios were identified. Stakeholders can also be referred to as actors, a term frequently used in disciplines such as economics, and which additionally stresses the point that the scenarios can be seen as a fictitious description of events in which the stakeholders have roles like actors in a play.

These stakeholders include *farmers*, because they manage the animals and so are key in influencing the level of animal welfare; *consumers*, because as a group they make purchase decisions between products which may vary in system of production and animal welfare characteristics; *retailers*, because they can make and influence important decisions

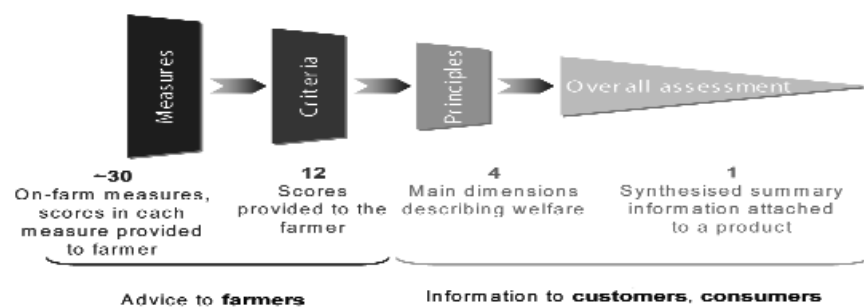
Table 1 Steps in scenario construction.

- 1 Define the issues you wish to understand better in terms of timeframe, scope and decision variables. Review the past to get a feel for degrees of uncertainty and volatility
- 2 Identify the major stakeholders or actors who would have an interest in these issues, both those who may be affected by it and those who could influence matters appreciably. Identify their current roles, interests and power positions
- 3 Make a list of current trends or pre-determined elements that will affect the variable(s) of interest. Briefly explain each, including how and why it exerts an influence. Constructing a diagram may be helpful to show inter-linkages and causal relationships
- 4 Identify key uncertainties whose resolution will significantly affect the variables of interest to you. Briefly explain how these uncertain events matter, as well as how they inter-relate
- 5 Construct two forced scenarios by placing all positive outcomes of key uncertainties in one scenario and all negative outcomes in the other. Add selected trends and pre-determined elements to these extreme scenarios
- 6 Next assess the internal consistency and plausibility of these artificial scenarios. Identify where and why these forced scenarios may be internally inconsistent (in terms of trends and outcome combinations)

Source: Schoemaker (1993).

Figure 1

Schematic view of the WQ assessment scheme. Source: Butterworth *et al* (2008).



regarding animal welfare in their sourcing policies and purchasing criteria; *other chain members*, traders, importers/exporters, and processors such as slaughter houses and dairy companies. In addition to these companies, brand manufacturers have powerful positions because, like retailers, they are in direct contact with the consumers.

Governments (including both the EU Government and Member State Governments) play an important role by shaping the policies, rules and legislation that set the boundary conditions for the chain members and consumers. Chain members and consumers are also influenced by *special interest groups*, including animal interest and environmental groups that bring their ideals forward to both industry and government. *Certification bodies* develop and implement standards on animal welfare and other issues like environment, labour conditions, safety and quality. They play an important role in the decisions on which assessment methodologies will be used (see also Table 2).

Pre-determined elements

As the third step, potential trends or pre-determined elements were identified which were considered to have the potential to affect the implementation of the WQ assessment methodology. To this end, we built on prior information from the project (eg Evans & Miele 2007) as well as on

Table 2 Actors, pre-determined elements and uncertainties in the scenarios.

Actors	Pre-determined elements	Uncertainties
Farmers	Quality assessment/transparency	Who will pay and gain
Consumers	Ethical food products	WTO
Retailers	Product differentiation	Dominant leader
Other chain actors	Globalisation	Scandals or scares
Governments	Animal-based measures	Existing schemes
Special interest groups	Awareness on societal issues	Economic climate
Certification bodies	Efficiency of assessment	Emphasis in societal concern
	Level playing field	Political agreement

discussions and presentations made during stakeholder conferences that were organised in the context of the project, and other available resources, including publications and research reports (eg Veissier *et al* 2007).

The identified trends included: a growing tendency in agricultural supply chains to make *quality assessments* and to

move toward increased *transparency* (for example, GlobalGAP www.globalgap.org [formerly called EurepGAP] is a safety, quality and sustainability scheme that is widely used among European supermarkets) (cf Ingenbleek & Meulenberg 2006; Ingenbleek *et al* 2007); an increase in production and availability of *ethical food products* (for example organic and Fair Trade) (eg Willer & Yussefi 2006); an increase in *product differentiation* (eg new variations on existing products, like new types of milk, yoghurt and processed meat) (cf Van Herpen & Liu 2004); increasing *globalisation* in the sense that national food production and consumption increasingly relies on cross-border trade of input materials, partially processed products and end products (while, at the same time, globalisation can result in an emphasis on local sourcing) (cf Traill 1997); a growing consensus among scientists and stakeholders that animal welfare should be measured by *animal-based measures* (Blokhuis *et al* 2010); an increased *awareness of societal issues* (although differences occur between different Member States) caused by, amongst others, media attention to issues like climate change, as well as unfolding events, such as the financial crisis, and events which put pressure on the ‘trustworthiness’ of economic and social institutions; the *efficiency of assessment* (because the ambition for precise assessment and overlapping assessments by different bodies has driven up costs, stakeholders increasingly devote attention to ‘efficiency’ of the process of measurement and control); an increase in the sense of a ‘*level playing field*’, referring to a growing wish for harmonisation within Europe and sometimes beyond.

In parallel with these trends is the sense that animal welfare issues are globalising. Animal welfare is, for example, increasingly a topic of discussion in emerging economies in Asia and Latin America (as illustrated by the organisation of congresses on this topic in, for instance, Uruguay [Animal welfare Congress: New Horizons for the 21st Century Current Experience and Future Objectives, 24-25 April 2007 in Montevideo] and China [The Importance of Animal Welfare Science to Sustainable Agriculture, 29-30 March 2008 in Beijing]) and international institutions such as OIE (World Organisation for Animal Health), FAO (Food and Agriculture Organisation) and the IFC (International Finance Corporation, which is a member of the World Bank Group) are increasingly active in developing animal welfare policies.

Uncertainties

As a fourth step in the scenario construction process, uncertainties were identified which could potentially have an effect on the implementation of the WQ methodology. Eight uncertainties were identified, these are discussed below.

A first uncertainty relates to *who will pay the costs, and who will gain the benefits* of an animal welfare assessment system? Farmers have expressed a fear that they will eventually be confronted with higher costs and they are doubtful about the economic advantages (Bock & Van Huik 2007). Alternatively, costs may be converted into the price paid by the consumer, or internalised in the costs of retailers and/or other chain members. However, it is also possible that

farmers might benefit from higher prices if animal welfare is perceived as added value by customers. Finally, it is also possible that farmers might experience cost decreases from managing animal welfare better (eg lower levels of mortality, skin lesions, lameness) (Enting *et al* 1997). A final possibility is that governments may support farmers and chain members to cover costs, through cross compliance payments or other ‘public good’ arrangements.

A second uncertainty constitutes the *World Trade Organisation* (WTO) which could potentially rule in favour (or against) product differentiation on the basis of animal welfare in international trade (Eaton *et al* 2006). If WTO were to rule against such differentiation, this might impact the use of animal welfare as a valid reason to set import tariffs, implement tax measures and the like.

A third uncertainty regards the influence of a *dominant leader*. This refers to the idea that not all development happens through gradual trends, but that shocks and ‘spike changes’ may occur as a result of the action of individuals or groups which have a strong influence (think of the role of Al Gore in generating awareness on climate change). This ‘dominant leader’ may take many forms, for example, a large retailer may adopt an animal-based assessment methodology in its purchasing criteria, or a coalition of environmental interest groups may support WQ and be supported by celebrities. The uncertainty is not only whether dominant leaders will play a role, but also whether this role will turn out positively or negatively for the implementation of the animal-based assessment methodology.

Fourth, comparable shock effects may be generated by *scandals or scares* regarding food production. In the past, animal disease and different forms of ‘production malpractice’ have received wide attention in the media, triggering altered purchasing by consumers and companies (McDonalds & Roberts 1998). Special interest groups may play a role in generating media attention.

Fifth, the WQ assessment methodology is not the only methodology that is used to measure animal welfare. *Existing schemes* already use other methodologies, and it is uncertain what attitude they may take towards this new entrant, or how they might consider the addition of animal-based measures to their existing methods.

Sixth, the general *economic climate* is included as an uncertainty.

Seventh, there is uncertainty with respect to the *emphasis in societal concern*. Public concern can cover a broad domain of social, economic, and environmental issues — including animal welfare. However, concern for a single issue may start to dominate the public debate (eg the credit crunch, climate change) thereby reducing specific attention to animal welfare.

Finally, there is uncertainty regarding *political agreement* on how the assessment methodology of the WQ project could be implemented and used. In January 2006, an EC Action Plan for the period 2006–2010 described the EC’s intention to introduce standardised animal welfare indicators (European Commission 2006). In this respect, certification (potentially based on the WQ assessment scheme) is given a central role because it could help enable consumers to make

informed choices. There is however not yet agreement on what kind of certification would be needed and how this should be implemented, nor has it been discussed which other purposes the assessment system could potentially serve (eg whether as a self-assessment tool for animal welfare to be used by farmers, or as a basis for minimum standards that compliment EU animal welfare legislation). Different options include several forms of mandatory labelling (based on the product specifications, production system, or based on EU minimum legal criteria), requirements for voluntary use of labels (EU-regulated standards for voluntary labelling either for individual products or for farming systems), an EU-wide label open for voluntary participation, and EU guidelines for the establishment of animal welfare labelling. A first assessment of stakeholders' opinions with regard to these options, revealed no single best solution (European Commission 2009). This illustrates that the use of the methodology is still surrounded by uncertainty regarding the extent of the political agreement on how the system should or could be implemented.

Results — Descriptions of forced (opposite extreme) scenarios

To explore these issues, we created two scenarios taken from a spectrum that includes a wide range of potential scenarios: one that contained all negative outcomes and one that contained all positive outcomes. By doing so, the variance between the scenarios was maximised, thus encompassing the broadest spread of possible futures for the implementation of the WQ assessment methodology. The scenario descriptions are provided below. To create a sense of 'time' in the scenario descriptions they are narrated in the past tense (looking back on the period 2010–2015) (Schoemaker 1993).

All negative scenario — 'How Welfare Quality® fell apart'

When the results of the Welfare Quality® project were published, the European Commission was pleased with the results and complimented the participants on a fine piece of work. The Commission took a 'wait and see' attitude. In its press statement the Commission argued that "the results will help all those companies that are investing in higher standards for animal welfare in order to legitimize their actions to citizens and consumers". There was no pressure from the EU Member States to take a more active approach since even those that were positive were unsure of how to proceed and did not want to 'go it alone'. National Governments were receptive to a strong lobby from agricultural sector organisations and other stakeholders, suggesting that intervention on animal welfare could further deteriorate the food crisis in the world. The dominant opinion leader, Al Gore had just given a speech in Brussels, responding to the drought in southern Europe and melting of the polar ice. All political energy became focused on the climate change issue. This was where all the action and publicity were focused. Animal welfare as an issue was more and more neglected in that process.

In the marketplace, most companies aimed at improving their corporate image by further improving their environmental

practices, reducing CO₂ emissions and supporting organisations, such as the World Wildlife Fund that were associated with sustainable development. The number of companies that included animal welfare in those activities declined. Meanwhile, the economic recession brought a halt to innovation. Not many new products and innovations were launched to the market. By 2013, throughout Europe, the emphasis was on keeping food affordable to consumers by limiting price increases for food. Consumers searched for more affordable products because of the increasing food prices. Their interest in added value and ethical products was reduced.

For the parts of the WQ system that were adopted in the market the final outcome was that the farmers were forced to pay. Retailers found themselves increasingly in a competitive battle with each other and with brand manufacturers and transferred the price pressure that they experienced from consumers to their suppliers. Farmers thus got stuck between increasing animal feed prices and a low willingness to pay for added value. Farmers developed a negative attitude towards WQ as well as to other schemes which aimed to measure and improve animal welfare. Among farmers, the system soon had a reputation for high cost and virtually no increase in earnings.

The WQ scheme appeared unable to prove that animal welfare was a valid issue for differentiation in international trade. Without back-up from the WTO, it turned out to be impossible to develop a cross-compliance arrangement for farmers. Emerging economies, led by China, protested against the intentions of the EU to set animal welfare requirements. Since there were many other schemes for animal welfare, some of which did not cost the producer anything, the WTO ruled unfavourably for the EU. Open access for all products therefore remained; regardless of how 'animal welfare-unfriendly' their system of production was. Some countries even started to export products with welfare claims, without being able to make clear what the underlying conditions were.

Because the WQ assessment methodology was now fully in the hands of the private sector, and because most companies had abandoned the topic of animal welfare or reduced their investments in that direction, only selected parts of the WQ system were used. The existing schemes responded to the pressure: some stuck to established (resource-based) measurement methods, some adopted parts of the methodology and others made their own variations on the methods to make them easier to implement. These methods were not always scientifically validated and animal interest groups started to fear that they would be copied into legislation. Since animal welfare was fading from the agenda, animal interest groups tried to reinstate it by making 'noise' wherever they could. As a consequence, companies that took initiatives to use the WQ assessment system made themselves vulnerable to negative publicity. Animal interest groups took these opportunities to show that animal welfare was not well taken care of, by showing the weaknesses in the system. This undermined the credibility of the WQ system as a whole. Because WQ did not provide these

companies the legitimacy they sought, they turned to animal interest groups, and as a result of these discussions, new measures and new combinations of measures emerged reflecting the agendas of the interest groups. Experts increasingly expressed their doubts about the validity and reliability of the assessment methodology and the WQ ‘baby’ got thrown out with the welfare assessment ‘bathwater’. By 2015, the term Welfare Quality® was no longer in use and its assessment methodologies were fragmented and scattered across the many different schemes that were in use in Europe.

All positive scenario — ‘An integrated component of sustainable development’

When the results of Welfare Quality® were published after a long period of positive interactions with policy-makers and industry, the results were welcomed by most stakeholders, including those in the market. Motivated to do so by opinion leaders in different Member States, big retailers and brand manufacturers started to use the new WQ assessment scheme for their products and use it in their purchasing policies. As a result of their dominance, other parties in the market chose to follow their example. Although the more radical animal activists were not fully satisfied with these measures, they were becoming increasingly marginalised as the more moderate animal interest groups were grouping themselves behind the initiatives. This provided legitimacy to the WQ system and reduced the impact of potential scandals and scares. This enabled companies to respond proactively to the attention directed at animal welfare. They started to make structural plans to further improve animal welfare over the next five to ten years. They also started to see the benefits of these policies, because by improving animal welfare, they also gained consumer confidence and improved their image as socially responsible companies.

Existing schemes which were already active in the market gradually adopted WQ as the assessment methodology by which animal welfare could be measured. They considered the methodology to ‘add’ to existing schemes, partly following the requests of dominant leaders in the industry which explicitly requested WQ, and partly following the advice of animal interest groups. Researchers continued to build upon and further refine the measures and methodology. Environmental problems and other issues were not competing for ‘attention’ with animal welfare, and instead, companies felt that they had to deal with an entire package of concerns in order to be responsive to society. Many schemes for the animal sectors therefore included environmental standards alongside animal welfare standards and made clear decisions on the points where both interests contradicted.

Responding to the adoption of animal welfare standards by influential chain actors, farmers were increasingly worried that they would eventually pay the price for all this. Responding to their call, most schemes took measures to encourage transparency in pricing, to show where the additional costs of these measures were going. In a positive international economic climate, consumers were increas-

ingly willing to pay for higher quality products and animal welfare turned out to be an issue that supported the quality image of products. In addition, farmers saw that they could rely on EU support in the form of cross-compliance. Farmer organisations supported these efforts because they saw this as an opportunity for farmers to make structural changes on the animal unit; improving food quality and animal welfare in the long term in a more cost effective manner. The WTO ruled in favour of EU plans to set import tariffs for products that could not demonstrate a sufficient level of animal welfare. Despite the protests of some Third World countries, the WTO judges were persuaded by the evidence that was derived from the WQ assessment scheme. This further supported development in those EU Member States where adoption of the WQ scheme was taking off more slowly. In southern and eastern Europe some farmers voluntarily implemented the scheme and it started to grow there from 2012 onwards. These farmers generally experienced an improvement in financial performance and job satisfaction. These farmers also felt that they were increasingly appreciated by society and by their peers. Very few farmers perceived the system as unpractical. Some eastern European countries even experienced a phase of rapid development as they were not hindered by the need to make large investments in existing housing systems as had sometimes been the case in north western European countries. Comparably, several Third World countries in Latin America in particular, but also Asia, perceived the assessment system as a trade opportunity and started implementing it. By 2015, WQ had therefore become an EU-wide system and an integral component of sustainable development and was on its way to being implemented globally.

Internal consistency and plausibility

The internal consistency and plausibility of these two forced scenarios was checked in three ways. First, the authors checked the statements and conditions themselves. Next, a group discussion was held with representatives from major pan-European businesses and animal welfare interest groups (including representatives from a large supermarket chain, a major food service chain, an animal production and slaughtering company, and the European Animal Welfare Platform, an established European group representing a cross-section of retailer and consumer views). Third, a group discussion was conducted with researchers from social and animal sciences participating in the WQ project. This meeting included 23 scientists from a number of EU countries (including Italy, Spain, Sweden, Norway, France, The Netherlands, UK, Austria, Germany) involved in disciplines such as animal science, sociology, economics, ethology, geography). Based on their comments, some changes were made to the scenarios (mainly rewording to avoid misinterpretation), but overall the scenarios were considered internally consistent (in terms of trends and outcome combinations).

With regard to the plausibility of the scenarios, the discussion participants acknowledged that these are two extreme scenarios, but in general, aspects of the negative scenario sounded more plausible to them. Since a major contributing

factor to that scenario was the lack of any co-ordinated 'management' of the WQ system, the need for some degree of institutional structure and support was considered essential as a way to reduce the likelihood of the negative outcome happening in reality. Consensus was reached among the participants on this idea of creating a body or institution that would fulfil a supporting and long-term future managing role surrounding the WQ assessment system and its implementation in the subsequent discussions. The precise role of this body was nevertheless a cause of some disagreement as different roles and functions were suggested by the participants, ie:

- A supporting role in stimulating adoption of animal-based assessment systems among farmers and business, and a management role once adopted. Here, one can think of advisory services, training and support packages that help individual farmers, farmer organisations, or farmer-retailer groups, and quality assurance checks made to ensure that the system is used correctly. The increasing amount of animal welfare data that would become available would help to develop these supporting products and services and the resulting database could be a valuable future resource that would need to be managed responsibly. Because national environments vary considerably within Europe, and specific expertise is available in Member States, such a role should at least be clearly linked to national information and practices.
- A scientific role, updating the system with the latest scientific developments on the measurement of animal welfare, and facilitating research that advances the analyses based on the animal welfare database (the database that contains the WQ measurement results).
- A level-setting role, turning the system into a measuring scheme against which farms, farming systems, brands and products can be benchmarked.
- A legitimising role, both in ensuring that the system has a solid acceptance basis among stakeholders in society, both within animal interest groups and beyond, and with the wider group of stakeholders concerned with sustainable development.

Discussion

The findings from the scenarios should be seen in the context of the main limitation of scenario analysis. This is that scenario analysis cannot be used to predict the future: it remains a learning tool. The two extreme scenarios presented in this article provide narrative descriptions of the bandwidth of potential futures for the WQ system. Applying the scenario analysis may help prevent the application of existing assumptions or ideas to a future in which these assumptions and ideas no longer hold. To this respect, the analysis raised new insights, which we highlight.

First, many studies on animal welfare policy focus on consumer acceptability of animal welfare standards (thereby implicitly suggesting that consumer acceptance is a critical success factor for animal welfare policy) (Bennett 1997; Bennett *et al* 2002; Frewer *et al* 2005; Evans & Miele 2007). The scenarios suggest that even though consumers are important actors in the scenarios, they represent only a

small proportion of the uncertainty associated with the implementation of an animal welfare assessment scheme. Like any stakeholder group, consumers are influenced by complex patterns of interacting factors and their perceptions and willingness to pay are likely to be strongly influenced by events which take place.

Second, whereas consumer preferences regarding animal welfare have received a great deal of attention, the role of companies, brands, and certification organisations is probably under-researched. The scenario exercise suggests that the acceptance of the assessment system by these actors is an important success factor, among others because consumers/citizens are influenced by supermarkets and food brands in their ethical food purchase decisions (Adams 2008). Future research may examine which factors drive the acceptability of an animal welfare assessment scheme for these actors.

Third, the scenarios suggest that the WQ scheme is unlikely to make it on its own. Too many actors play a role in its future and each of them has its own stake, without any of them having the explicit role of facilitating the implementation of the system. To this respect, our analyses emphasise the importance of a body or an institution to facilitate the implementation of the animal welfare assessment scheme. This insight agrees with findings from innovation system analysis. Lundvall *et al* (2002) state in their article on innovation-system research that the course of development in particular industries may conflict with the policy ambition to make the industry more environmentally and socially sustainable. They highlight the need for institutions to guide innovation and developments, by stating that:

there is a need for policy learning in terms of building new kinds of institutions for policy co-ordination. Such institutions would have strategic responsibilities to develop a common vision for how to cope with the challenges and contradictions of the globalising learning economy.

More recently, a report from the European Parliament (Committee on Agricultural and Rural Development 2010) evaluating the EU Animal Welfare Action Plan also:

Considers that a European coordinated network for animal welfare should be set up..... [and] considers that such a network should designate one institution as the coordinating body.

The scenarios exercise presented in this paper taught us that creation of a body which can support and manage the development of an assessment system appears to be necessary if we want to prevent a negative scenario from taking place.

Animal welfare implications and conclusion

The most important lesson that can be drawn from the forced scenarios is that a positive impact on animal welfare from the finalisation of the WQ project cannot be taken for granted. Whether the project results will eventually be implemented and have a positive impact on animal welfare will depend on the outcome of a number of uncertainties, such as who will pay for them, and who will gain, what role the WTO will play and whether a dominant leader will influence the course of events. Whereas the development of animal-based measurement tools for animal welfare is an

important step into a future in which farm animal welfare may be aligned with expectations of the general public, implementing this system is going to be a challenge which will require action, support and a willingness to 'engage' from a wide range of stakeholders.

The insights obtained from our scenarios have several implications for policy-makers concerned with farm animal welfare. Policy-makers may need to pay more attention to stakeholder groups other than consumers. The final acceptance of the system is likely to result from an interplay between all stakeholders. In particular, harmonising the efforts of brands, companies, and certification organisations may help to increase the chance of acceptance of the system. Finally, the insights imply that leaving the interplay of factors entirely up to coincidence may possibly lead to destruction of the system. Establishing a body that helps to co-ordinate the interests of different stakeholders may help to prevent such a negative outcome.

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References

- Adams RJ** 2008 Fast food and animal rights: an examination and assessment of the industry's response to social pressure. *Business Society Review* 113(3): 301-328
- Bennett RM** 1997 Farm animal welfare and food policy. *Food Policy* 22: 281-288
- Bennett RM, Anderson J and Blaney RJP** 2002 Moral intensity and willingness to pay concerning farm animal welfare issues and the implications for agricultural policy. *Journal of Agricultural and Environmental Ethics* 15: 187-202
- Blokhuis HJ** 1998 Integration of animal welfare in intensive animal production. In: Wensing T (ed) *Production Diseases in Farm Animals* pp 222-229. Wageningen Press: Wageningen, The Netherlands.
- Blokhuis HJ, Jones RB, Geers R, Miele M and Veissier I** 2003 Measuring and monitoring animal welfare: transparency in the food product quality chain. *Animal Welfare* 12: 445-455
- Blokhuis HJ, Keeling LJ, Gavinelli A and Serratos J** 2008 Animal welfare's impact on the food chain. *Trends in Food Science & Technology* 19: 75-83
- Blokhuis HJ, Veissier I, Miele M and Jones RB** 2010 The Welfare Quality® project and beyond: safeguarding farm animal well-being. *Acta Agriculturae Scandinavica A, Animal Science* 60: 129-140
- Bock BB and van Huik MM** 2007 Animal welfare: the attitude and behaviour of European pig farmers. *British Food Journal* 109: 931-944
- Bornett HLI, Guy JH and Cain PJ** 2003 Impact of animal welfare on costs and viability of pig production in the UK. *Journal of Agricultural and Environmental Ethics* 16: 163-186
- Bracke MBM, Metz JHM, Dijkhuizen AA and Spruijt BM** 2001 Development of a decision support system for assessing farm animal welfare in relation to husbandry systems: Strategy and prototype. *Journal of Agricultural and Environmental Ethics* 14: 321-337
- Butterworth A, Veissier I, Manteca X and Blokhuis HJ** 2008 Welfare trade. *Public Service Review: European Union* 15: 456-459
- Committee on Agriculture and Rural Development** 2010 Paulsen M (rapporteur). *Report on evaluation and assessment of the Animal Welfare Action Plan 2006-2010 (2009/2202[INI])*. European parliament session document A7-0053/2010. <http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+REPORT+A7-2010-0053+0+DOC+PDF+V0//EN>
- De Geus AP** 1988 Planning as learning. *Harvard Business Review* 66: 70-74
- Den Ouden M, Huirne RBM and Dijkhuizen AA** 1997 The impact of changing pig welfare preferences on the economics of pork production-marketing chains. In: Wierenga B, van Tilburg A, Grunert K, Steenkamp JBEM and Wedel M (eds) *Agricultural Marketing and Consumer Behavior in a Changing World* pp 75-91. Kluwer Academic Publishers: Boston, USA
- Eaton D, Bourgeois J and Achterbosch T** 2006 Product differentiation under the WTO: an analysis of labelling and tariff or tax measures concerning farm animal welfare. *Paper presented at the IATRC Summer Symposium*. Bonn, Germany
- Enting H, Kooij D, Dijkhuizen AA and Huirne RBM** 1997 Economic losses due to clinical lameness in dairy cattle. *Livestock Production Science* 49: 259-267
- European Commission** 2009 *Options for Farm Animal Welfare Labelling and the Establishment of a European Network of Reference Centres for the Protection and Welfare of Animals. Summary of the Impact Assessment Report*. EC: Brussels, Belgium
- European Commission** 2006 *Communication from the Commission to the European Parliament and the Council on a Community Action Plan on the Protection and Welfare of Animals 2006-2010, COM13 Final*. EC: Brussels, Belgium
- Evans A and Miele M** 2007 *Consumers' Views about Farm Animal Welfare. Part I, Welfare Quality 4*. Cardiff University Press: Cardiff, UK
- Fahey L and Randell RM** 1998 *Learning from the Future; Competitive Foresight Scenarios*. John Wiley & Sons: New York, USA
- Frewer LJ, Kole A, Van de Kroon SMA and de Lauwere C** 2005 Consumer attitudes towards the development of animal-friendly husbandry systems. *Journal of Agricultural and Environmental Ethics* 18: 345-367
- Godet M** 2000 The art of scenarios and strategic planning: tools and pitfalls. *Technological Forecasting & Social Change* 65: 3-22
- Hatanaka M, Bain C and Busch L** 2005 Third-party certification in the global agrifood system. *Food Policy* 30: 354-369
- Henson S** 1997 Estimating the incidence of food-borne *Salmonella* and the effectiveness of alternative control measures using the Delphi method. *International Journal of Food Microbiology* 35: 195-204
- Hobbs AL, Hobbs JE, Isaac GE and Kerr WA** 2002 Ethics, domestic food policy and trade law: assessing the EU animal welfare proposal to the WTO. *Food Policy* 27: 437-454

- Ingenbleek PTM and Meulenberg MTG** 2006 The battle between 'Good' and 'Better'. A strategic marketing perspective on codes of conduct for sustainable agriculture. *Agribusiness: An International Journal* 22: 451-73
- Ingenbleek PTM, Binnekamp M and Goddijn S** 2007 Setting standards for CSR: a comparative case study on criteria-formulating organizations. *Journal of Business Research* 60: 539-548
- Keeling LJ** 2009 An overview of the development of Welfare Quality project assessment systems. *Welfare Quality Reports No.12* pp 97
- Linneman RE and Klein HE** 1983 The use of multiple scenarios by US industrial companies: a comparison study 1977-82. *Long Range Planning (December)*: 94-101
- Lundvall BA, Johnson B, Andersen ES and Dalum B** 2002 National systems of production, innovation and competence building. *Research Policy* 31: 213-231
- McDonald S and Roberts D** 1998 The economy-wide effects of the BSE-crisis: a CGE analysis. *Journal of Agricultural Economics* 49: 458-471
- Phelps R, Chan C and Kapsalis SC** 2001 Does scenario planning affect performance? Two exploratory studies. *Journal of Business Research* 51: 223-232
- Porcher J** 2001 Le travail dans l'élevage industriel des porcs. Souffrance des animaux, souffrance des hommes. In: Burgat F and Dantzer R (eds) *Un Point Sur ... Les animaux d'élevage ont-ils droit au bien-être?* pp 23-64. INRA Editions: Paris, France. [Title translation: Labour in industrial pig farming: animal suffering, human suffering. In: Are Farm Animals Entitled to their Well-being?]
- Rikkonen P** 2005 Scenarios for future agriculture in Finland: a Delphi study among agri-food sector stakeholders. *Agricultural & Food Science* 14: 205-223
- Rogers EM** 2003 *Diffusion of Innovations*. Free Press: New York, USA
- Schoemaker PJH** 1993 Multiple scenario development: its conceptual and behavioral foundation. *Strategic Management Journal* 14: 193-213
- Technology Futures Analysis Working Group** 2004 Technology futures analysis: toward integration of the field and new methods. *Technological Forecasting & Social Change* 71: 287-303
- Trail B** 1997 Globalisation in the food industries? *European Review of Agricultural Economics* 24: 390-410
- Van Herpen E and Liu J** 2004 Demand-driven assortment management. In: Verhallen T, Gaakeer C and Wiegerinck VJJ (eds) *Demand Driven Chains and Networks*. Reed Business Information: The Hague, The Netherlands
- Weissier I, Forkman B and Jones B** 2007 Assuring animal welfare: from societal concerns to implementation. *Welfare Quality, Proceedings of the Second Welfare Quality Stakeholder Conference*. 3-4 May 2007, Berlin, Germany
- Welfare Quality®** 2009a *Welfare Quality® Assessment Protocol for Poultry (Broilers, Laying Hens)*. Welfare Quality® Consortium: Lelystad, The Netherlands
- Welfare Quality®** 2009b *Welfare Quality® Assessment Protocol for Cattle*. Welfare Quality® Consortium: Lelystad, The Netherlands
- Welfare Quality®** 2009c *Welfare Quality® Assessment Protocol for Pigs (Sows and Piglets, Growing and Finishing Pigs)*. Welfare Quality® Consortium: Lelystad, Netherlands.
- Willer H and Yussefi M** 2006 *The World of Organic Agriculture: Statistics and Emerging Trends 2006*. IFOAM: Bonn, Germany