Animal-based indicators for welfare assessment
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Département Phase, Asirpa (socio-Economic Analysis of The Diversity of Impacts of Public Research For Agriculture)

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Animal-based indicators for welfare assessment

October 2014

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   HJ Blokhuis (SLU, Sweden).
Context

The strong societal concern for animals has been expressed through various surveys and in-depth studies. European consumers consider themselves not well enough informed about the welfare of the animals from which the products that they purchase are produced (European Commission 2007a;b). There is also societal pressure for corporate responsibility and the care for animal welfare is part of it (Amos and Sullivan 2013 ). Since the 70’s European conventions for the protection of animals (by the Council of Europe) followed by EU directives or regulations to protect farm animals have been adopted. They focused on an obligation of means (space allowance, food, enrichment material...). The Farm Animal Welfare Council from the United-Kingdom defined 5 essential freedoms for the welfare of animal to be assured: freedom from hunger and thirst; freedom from physical discomfort; freedom from diseases, pain and injuries; freedom to express normal behaviours; freedom from fear and distress (Farm Animal Welfare Council 1992). The five freedoms are largely used to establish recommendations, legislation, or certification schemes. Economic actors and NGOs developed welfare friendly schemes on this basis and started to use welfare claims. This in turn caused a clear need to substantiate and harmonise those claims in order to place issues related to the fulfilment of animal welfare on a level playing field for all economic actors.

The so-called Amsterdam treaty (European Union 1997) recognises animals as sentient beings. This initiated a move towards what animals can perceive rather than thinking of what might be good to animals from a human perspective. Indeed, welfare has all to do with the state of the animal.

Each of the five freedoms can be assessed thanks to specific indicators. Research on animal welfare was more widely initiated in the 70’s, starting mainly in the United-Kingdom but expanding through Europe. It was shown possible to demonstrate that animals have preferences and emotions (Dawkins 1983, Boissy et al 2007, Veissier et al 2009). Animal-based indicators were developed to consider what matters to animals, rather than attempting only to ‘be good to animals’ as perceived by humans. In addition animal welfare is determined by many factors, the sum of which can be difficult to check, whereas animal-based indicators have the potential to produce a more holistic view of the welfare of an animal (no matter the reasons why this welfare would be impaired or improved). There was thus high potential for such animal-based indicators to provide evidence of how animals experience their environment and for checking that a given environment provides (or not) good animal welfare.
Inputs and productive configuration

Stimulated by EU directives under preparation or revision in the 1980s and 1990s, researchers from INRA and engineers from technical institutes (Idele\(^1\), Itavi\(^2\), Ifip\(^3\)) started to work together and with private actors to assess farming systems and find remedial solutions to welfare problems.

The French AgriBEA network was created at INRA in 1998\(^4\) with the aim of stimulating exchanges between INRA scientists carrying out research on animal welfare and in order to better address this societal concern. From a group of only 40 INRA scientists, mainly from the PHASE division but also from the social sciences sector, the network very rapidly grew within INRA (scientists from various scientific divisions: PHASE, SA, GA, SAD, SAE2, CEPIA). After 6 months of existence, the network was extended to other actors involved in research: technical institutes, ANSES, high schools in veterinary medicine and agronomy, universities... At present about 150 people are affiliated to the network from various disciplines: behaviour, psychology, physiology, animal production, genetic, epidemiology, pathology, economy, sociology, philosophy. The activities of AgriBEA are open to a large public: NGOs (PMAF\(^5\), OABA\(^6\)), political actors (Ministry for Agriculture), and economic actors (e.g. farmers or farmers’ organisations) often attend or even contribute to seminars organised by AgriBEA. A common culture regarding animal welfare was built, based on the acknowledgement that welfare has to do with the animal’s perception of its environment and condition, as well as a common understanding of how to improve animal welfare through research, education, implementation of farming practices...

At EU level, a similar network was built thanks to the COST Action 846 *Measuring and monitoring farm animal welfare* (2000-2006). The French partners were again INRA and the technical institutes members of AgriBEA. The network was led by WUR (Harry Blokhuis, the Netherlands) and INRA PHASE (Isabelle Veissier) was one of the 4 members of the executive committee. There was a close connection between AgriBEA and this COST Action with all information from COST Action being disseminated to AgriBEA members and AgriBEA members taking part in many task forces of the COST Action. The exchanges facilitated bilateral collaborations, co-construction of projects and contributions to large EU projects.

The Welfare Quality® project (2004-2009) was an integrated European research project, with 43 partners from 13 European countries. The partners were animal scientists or engineers from the former COST Action 846, from a network of European social scientists, and from industries. In France, INRA, Idele, Ifip, ISA-Lille, and several universities (Toulouse, Paris6) contributed to the project. Welfare Quality® was typically an inter-disciplinary project where most results could not be obtained within one discipline but demanded close collaborations between disciplines (especially animal sciences, social sciences, and mathematics). The ultimate goal was to design protocols for the evaluation of animal welfare, essentially based on measures on animals taking into account expectations from citizens-consumers, producers and retailers. The methods were shared between partners, a database of welfare results was created, and the results and expertise from the different partners were pooled to design the final protocols. Although the consortium of Welfare Quality®

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1. Institut de l’élevage (bovins, ovins, caprins)
2. Institut technique pour les volailles et les lapins
3. Institut technique du porc
4. AgriBea was first coordinated by 3 scientists from Physiology and animal production departments (merged thereafter into Phase) : Robert Dantzer, Frederic Lévy, and Isabelle Veissier. It is now coordinated by Alain Boissy and Cecile Arnould (Phase), Pierre Mormède (GA), François Hochereau (SAD)
5. Protection mondiale des animaux de ferme
6. Œuvre assistance aux bêtes d’abattoir
included essentially research organisations, exchanges with non-scientific actors were organised:

- An Advisory board was put in place. It comprised of representatives of producers (CopaCogeca, European dairy farmers), food sector, veterinarians, certifying organisations, NGO (Eurogroup for animals), with observers from OIE\textsuperscript{7} and DG-Sanco\textsuperscript{8} ... (Annex 1)
- Producers participated in the research conducted in Welfare Quality\textsuperscript{®}: 600 farms were visited across Europe and the farmers were interviewed on their perception of the visit, and discussion panels were organised.

**Research outputs**

One hundred scientific papers in peer-reviewed journals were released from Welfare Quality\textsuperscript{®}. After the project, a book was produced by the steering committee to explain how Welfare Quality\textsuperscript{®} was developed:


The most important products of the project, in terms of impacts, are the protocols for the assessment of animal welfare for cattle, pigs, and poultry (Welfare Quality\textsuperscript{®} 2009a;b;c). The interactions with actors and their impacts on the final protocols are described in Miele et al. (2011). The Netherlands Standardization Institute (NEN, private non-profit organisation for the development and promotion of standards) helped in drafting the protocols so that they could form a standard. These textbooks:

- explain the rationale for developing the protocols (e.g. 12 welfare criteria, rationale for the evaluation models)
- describe the various indicators necessary to check that farms or slaughter plants comply with the 12 criteria (30-50 measures for the various animal types addressed in the project: dairy cows, fattening cattle, calves, fattening pigs, sows and piglets, laying hens, broilers),
- detail the calculation of scores so that data collected on farms or at slaughter are used to produce welfare scores and an overall evaluation of the farm or slaughter plant.

As much as possible, the measures are taken on animals (body condition, clinical signs, behaviour, lesions). When no valid or feasible animal-based indicators were available, then resource-based indicators were included (e.g. number of drinkers to indirectly assess absence of thirst).

The protocols are freely available from the website of the Welfare Quality Network\textsuperscript{9}. This network was created at the end of the Welfare Quality\textsuperscript{®} project in order to make the protocols alive and to incorporate refinements thanks to new knowledge and technology.

The WAFA software chain was created to calculate welfare scores. It includes a database to store the data from farms and slaughter plants and their welfare scores, and a website that provides explanations on the protocols and the overall statistics (average welfare scores across farms visited). A service is proposed to calculate welfare scores. So far, 1062 farms have been visited and their data

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\textsuperscript{7} World organisation for animal health
\textsuperscript{8} DG Health and consumers from the European commission
\textsuperscript{9} http://www.welfarequalitynetwork.net/network
included in the database. More farms were visited all over the world, without data recorded in the database.


<table>
<thead>
<tr>
<th>Structure / Project</th>
<th>Role of INRA in the productive configuration and in the production of outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>AgriBEA</td>
<td>Establishment, coordination</td>
</tr>
<tr>
<td>Cost Action 846</td>
<td>Member of the executive committee (4 members), coordination of activities on measuring welfare</td>
</tr>
<tr>
<td>Welfare Quality®</td>
<td>Contribution to coordination (member of the steering committee)</td>
</tr>
<tr>
<td></td>
<td>Specific contribution in defining the 12 welfare criteria to be checked on farms /at slaughter (UMRH due to specific awareness of requirements for multicriterion evaluation, coll. with University Paris 6)</td>
</tr>
<tr>
<td></td>
<td>Contribution to identification and validation of animal-based indicators in pigs (stereotypies, injuries, human-animal relationship: Pegase), poultry (clinical observations: PRC), cattle (human-animal relationship: UMRH). INRA experimental facilities were used to run experiments to validate indicators.</td>
</tr>
<tr>
<td></td>
<td>Construction of evaluation model (investigation of multicriterion decision methodologies): Inra coordinated the work-package devoted to this construction and had a large contribution to it (e.g. one PhD thesis doing the pilot construction). This task required input from animal sciences (from INRA and other EU partners), from social sciences (EU partners of the project, not INRA) and mathematics (strong collaboration with Univ. Paris 6, co-supervision of the PhD thesis).</td>
</tr>
<tr>
<td></td>
<td>Development of the software chain to calculate welfare scores from data collected on farms / at slaughter and to store data and score: INRA computer scientists fully supported this development. This task was under the full responsibility of INRA (3 computer scientists + 2 animal scientists).</td>
</tr>
</tbody>
</table>

Knowledge flow and intermediaries

During the Welfare Quality® project, several means were used to disseminate largely the results of the project and the final protocols: a website was created at the start of the project, a newsletter was released every 6 months, 11 fact sheets with main findings were produced in 5 languages, 19 reports (~100 pages each) were written with extensive information on the project results, a video was produced etc. In addition to this ‘passive’ dissemination, the final Welfare Quality® rationale and the protocols were actively transferred to potential end-users thanks to contribution to agriculture fairs, to presentations at stakeholders’ workshops and the organisation of three stakeholders’ conferences (Annex 2). These activities were organised according to a communication plan supported by a communication officer recruited for the project and members of the Steering Committee in charge of the science-society dialog (Mara Miele, Cardiff Univ.) and demonstrations (I. Veissier, INRA). Stakeholder’s workshops and conferences raised awareness among policy makers, producers, the food industries or retailers, on the possibility and the potential benefits of using animal-based indicators. The Advisory Board of Welfare Quality® was also essential to establish a dialogue with potential end-
users, including policy makers (OIE, DG-Sanco). In addition, the members of the Steering Committee of Welfare Quality® exchanged regularly with DG-Sanco during and after the project and were regularly requested to give talks in events organised at EU level (e.g. EU parliament).

In 2007, the European Economic and Social Committee and the European Commission (EESC)\textsuperscript{10} held the workshop “Animal welfare: improving by labelling?”. The rationale of Welfare Quality® and its first results were discussed by partners of the project, including INRA. The meeting concluded on the need to have tools for a scientific assessment of animal welfare.

The European Animal Welfare Platform\textsuperscript{11} was put in place in 2008 in the course of the Welfare Quality® project. Members were representatives of breeders, farmers, consumers, the processing industry, and animal welfare organizations. The platform looked for ways to improve animal welfare at all levels of the food chain and contributed to the integration of emerging science-based animal welfare assessment systems with existing quality assurance schemes. Definitely Welfare Quality® was a significant input to the work undertaken by the platform (European Animal Welfare Platform 2011).

After the project ended, some actors played a major role in the dissemination and extrapolation of the results:

First of all, partners of the project - including INRA - participated in the EFSA\textsuperscript{12} panel for animal welfare and related working groups. On request of the EU Commission, EFSA started to work on animal-based indicators in 2009. It reviewed the literature and organised stakeholders’ meetings to discuss the potential of animal based indicators to assess the risks to animal welfare. In 2012, EFSA produced two opinions on the use of such indicators, one for dairy cows and one for pig, and a more general statement where concepts of risk factors and their consequences on animals were put forward, and how these consequences could be measured in practice was discussed (EFSA Panel on Animal Health and Welfare (AHAW) 2012a;b;c). This statement largely referred to the work done in Welfare Quality®. In 2013, a similar study was carried out to analyse ways to detect proper stunning and killing of animals (European Food Safety authority- AHAW Panel (Animal Health and Welfare) 2013). EFSA concluded on the need to move towards risk assessment of welfare by using animal-based indicators (see frame below). The benefits of using animal based indicators is nicely summarised on the video ‘animal-based indicators’ released by EFSA in 2012\textsuperscript{13}.


\textsuperscript{11} 3-year (2008-2011) European Commission’s sponsored project. It brings together different stakeholders in the food chain, from farmers, processors, retailers, food producers, and NGOs. Through this stakeholder approach and an EU wide consultation animal welfare issues were identified and prioritized for Beef and Dairy, Poultry Meat and Eggs, Farmed Fish, Pork. http://www.animalwelfareplatform.eu/Objectives.php. The platform was coordinated by the same person as for the Welfare Quality® project (H. Blokhuis). The Welfare Quality® results were an important input for the work of the platform.

\textsuperscript{12} European Food Safety Authority, in charge of risk assessment regarding food and feed safety (including risks for animal welfare) for The European Union.

\textsuperscript{13} https://www.youtube.com/watch?v=m6pM56j0vg
Technical meeting on the use of animal-based measures for the welfare of dairy cows, pigs and broilers (European Food Safety Authority 2012) - Extract

EFSA aims at moving towards quantitative risk assessment of the welfare of target animal populations. This can only be performed on the basis of the collection of standardised indicators by possibly using data sources on ABMs already existing and available in the field, and channelling the information in a single database. ABMs are indeed considered a real potential to steer EFSA work into that direction.

At the same time, DG-Sanco together with FVE\textsuperscript{14} initiated a training program organised for vet practitioners on animal welfare evaluation based on the Welfare Quality\textsuperscript{®} protocols. From 2011, seven workshops were organized in Hungary, Spain, Latvia, Romania, Italy, Netherlands and Poland. The next one will take place in France (organised by VetAgro Sup, a close partner of INRA). Until now, more than 900 veterinarians from over 20 European countries have been trained.

In France, several key elements helped disseminating knowledge and increase awareness on animal welfare:

- The RMT\textsuperscript{15} "bien-être animal et systèmes d’élevage" was created in 2008 to stimulate exchange of knowledge between 60 partners from the research sector, agricultural development, initial and postgraduate education, and professional training. Its various outcomes include reviewing resources and animal-based indicators for welfare assessment in different productions, exploring user’s perception and ways for increasing awareness (CASDAR project EBE), materials for undergraduate students’ education and professional training. The activities of the RMT and the CASDAR project are followed closely by the French ministry for agriculture (DGAL).

- High schools and universities organise courses on animal welfare evaluation where animal-based indicators are presented and their relevance is discussed. Such courses take place in agricultural, veterinary, or applied ethology curricula (in France: high schools VetAgro Sup, AgroCampus Ouest, ENSV, DU Ethologie appliquée inter-universitaire). INRA and VetAgro Sup scientists are the main contributors.

- The French Agency for Food, Environmental and Occupational Health and Safety (ANSES) set up a specific thematic group on animal welfare in 2012 to address issues related to farming methods for different animal species and topics such as indicators of animal welfare. Animal-based measures strongly underpin the risk assessment for animal welfare, as seen in the expertise on the slaughter of calves and adult cattle (Anses 2012; 2013).

- Face-to-face meetings with key stakeholders - often under the initiative of these stakeholders whose awareness had been raised thanks to the ample communication around the Welfare Quality\textsuperscript{®} project - were held. For instance, INRA exchanged closely with representatives of Carrefour, DANONE, McKey, Charal, Bressor, Bongrain... This resulted in collaborative projects (e.g. DANONE-INRA project on dairy cows welfare). In addition, agreements were made between INRA on the one hand and PMAF\textsuperscript{16} or Idele on the other hand in order to keep each other informed of activities related to animal welfare. The start-up ETRE was created in 2011 by an ex PhD student of INRA (Bourguet 2010) for behavioural and welfare studies.

\textsuperscript{14} Fédération Européenne Vétérinaire

\textsuperscript{15} Technical Joint Networks are instruments from the French Ministry for agriculture to boost innovation by merging expertise from research, education, and development. http://agriculture.gouv.fr/IMG/pdf/Brochure_reseaux_mixtes_technologiques_2009.pdf

\textsuperscript{16} Protection Mondiale des Animaux de Ferme
### Structure / Project

<table>
<thead>
<tr>
<th>Role of INRA along the chain of intermediaries</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Welfare Quality®</strong></td>
</tr>
<tr>
<td><strong>EFSA</strong></td>
</tr>
<tr>
<td><strong>DANONE-INRA project Welfare</strong></td>
</tr>
<tr>
<td><strong>ANSES</strong></td>
</tr>
<tr>
<td><strong>RMT Bien-être et systèmes d’élevage</strong></td>
</tr>
<tr>
<td><strong>High Schools, universities, professional training</strong></td>
</tr>
<tr>
<td><strong>Idele, PMAF</strong></td>
</tr>
<tr>
<td><strong>E.T.R.E</strong></td>
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</table>

### Impacts 1: Adoption of animal-based indicators

As suggested in the introduction, animal-based indicators allow accurate assessment of the welfare of animals by considering the state of these animals (rather than the resources provided to them or the management practices).

**Political impacts**

**European level: Contribution to the formulation of European Union strategy to protect animals**

In the Community action plan 2006-2010 to protect farm animals, the EU expressed a will to move from an obligation of means (that are to be checked with resource-based indicators) to an obligation of results (to be checked with animal-based indicators). Some animal based indicators have already been introduced in the broiler directive in 2007 (Council Directive 2007/43/CE: the stocking density can be increased if the mortality is low) and in the regulation on slaughter (Council Regulation 2009/1099/EC: stunned animals have to be monitored to ensure that they do not regain consciousness before killing). The use of animal-based indicators is further stressed in the 2012-2015 Community action plan (see extract below).
Community action plan 2012-2015 (European Commission DG-Sanco 2012) - Extract

“Subject to an impact assessment, the Commission will consider the need for a revised EU legislative framework based on a holistic approach. In particular, the Commission will consider the feasibility and the appropriateness of introducing science-based indicators based on animal welfare outcomes as opposed to welfare inputs as has been used so far; the Commission will assess whether such a new approach would lead to a simplified legal framework and contribute to improve the competitiveness of EU agriculture.

Page 7:
“The possibility of using scientifically validated outcome-based indicators complementing prescriptive requirements in EU legislation will be considered when necessary with a specific attention to the contribution of such new approach to the simplification of the acquis. Animal-based indicators have been introduced in two recent pieces of EU animal welfare legislation (Directive 2007/43/EC laying down minimum rules for the protection of chickens kept for meat production and Regulation (EC) No 1099/2009 on the protection of animals at the time of killing).

Criteria developed by the Welfare Quality® project associated with a risk assessment system as applied in the food safety area (see the Food law) will be examined. The EFSA Scientific Opinions on the development of welfare indicators would be taken into account together with socio-economic factors in considering the relevant risk management proposals.

The use of outcome-based animal welfare indicators is also recognised at international level by organisations such as the World Organisation for Animal Health (OIE).”

The EU parliament recognised the importance of the strategy proposed by the EU Commission and again recalls the progresses that could be made thanks to the Welfare Quality® project17 (see extract below):


Within the field of animal welfare there has been an increase in the research carried out over the last decade, both in the EU and elsewhere, such as the Welfare Quality Project. This ever-growing scientific knowledge is the most logical basis for the Animal Welfare Strategy and legislation. It is important that this knowledge is used in all aspects of animal practice from the development of new technology and building of animal housing through pre-testing, to the overall supervision and control of animal welfare with the Union.

National competent authorities:

French Ministry in charge of agriculture: help in controls

Inspections of farms and slaughter plants are compulsory under the framework of cross-compliance (farmers must comply with EU legislation in order to benefit from European subsidies). The inspections are often based on checking the compliance of farms with norms such as space allowance or provision of certain types of food. To date, in France, animal-based indicators are used at slaughter to check the efficiency of stunning, in accordance with Regulation 2009/1099/EC. Animal-based indicators could be used more broadly, especially when no specific norms exist (e.g. for the farming of cattle). A PhD thesis is currently supported by the French Ministry for agriculture to compare the perception of animal-based vs. resource-based indicators by dairy farmers and their potential to stimulate actions to improve cattle welfare (Anne-Claire Dereclenne-Lomellini, thesis supervised and hosted by INRA).

Other EU countries

Similar initiatives were taken abroad. For instance, the Swedish Centre for Animal Welfare analysed the benefits of animal-based vs. resource-based indicators (ENCAW project). INRA contributed to this work (Veissier et al 2011). In the Netherlands, the Welfare Quality® protocols were implemented in 50 broiler, 50 veal and 50 dairy farms to try them out over 3 years (project co-funded by the private sectors (33%) and by ministry for agriculture and economy (66%)). In Denmark the government wishes to assess animal welfare at national level: existing datasets are used (e.g. data collected at slaughter, use of antibiotics, mortality) and a lighter version of the Welfare Quality® protocols is used.

Evaluation of the political impact (see Annex 3 for details on the analysis)

<table>
<thead>
<tr>
<th>Dimension (weight)</th>
<th>Score (1-5)</th>
<th>Arguments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobilisation in public debate (x1)</td>
<td>4</td>
<td>Strong and novel messages easily identifiable. The knowledge produced matches a window of opportunity in the public debate. Media coverage is strong toward the general public and professionals. The debate concerns the whole relevant political sphere.</td>
</tr>
<tr>
<td>Use in public policy (x1)</td>
<td>5</td>
<td>Important use at several steps of the political cycle, at relevant territorial scales</td>
</tr>
<tr>
<td>Middle-term impact in diffusion of ideas (x1)</td>
<td>4</td>
<td>The knowledge may influence a debate with strong stakes. It circulates in scientific and non-scientific circles. Research results are renown and rarely distorted while circulating. The contribution of research to the debate is long lasting</td>
</tr>
<tr>
<td>Stake of the relevant policy (x3)</td>
<td>3</td>
<td>Limited stakes of the debate. Few economical or environmental aspects. Crisis involving a large population at national and international level.</td>
</tr>
<tr>
<td>TOTAL (/30) (/5)</td>
<td>=22 /30 = 4/5</td>
<td></td>
</tr>
</tbody>
</table>

Social impacts

**Animal welfare associations: sound basis for dialog with stakeholders**

For animal welfare associations, the animal has an intrinsic value. Animal-based indicators provide a sound basis for addressing animal welfare issues, i.e. showing that animal welfare can be measured adequately, and this facilitates the dialog with industries. These indicators are used to assess practices and systems. Welfare Quality® protocols are used for the species for which they are available.

The face-to-face communication with lay people remains based on the description of systems, not on their exact effects on animals; this is due to the fact that people often cannot bare the description of animals suffering and trust animal welfare associations in the way they judge these systems. The communication through internet can more easily address the state of animals, probably because it reaches a younger public and internet imposes some distance with the real world.
Agrifood business: inclusion of animal welfare in companies’ strategic plans

Business Benchmark on animal Welfare business (Amos and Sullivan 2013) - Extract

Farm animal welfare is an important business issue for all food sector companies; retailers, service companies, manufacturers, processors and producers. This is being driven by a range of factors including regulation, consumer concern, client demand, and the brand and market opportunities for companies that adopt higher farm animal welfare standards (or the risks of not addressing the issue).

Several companies now include animal welfare in their strategy for ‘sustainable sourcing’ (see DANONE, Carrefour, and Mac Donald’s websites and also extract above). Animal welfare is seen as being part of corporate responsibility. The strategy is in general to request suppliers to comply with a good level of welfare and technical advice is given to the suppliers to reach good standards. The companies often work with NGOs to set up welfare plans or ‘cahiers des charges’ (PMAF, CIWF, Gaia...).

Animal-based indicators are used to:

- Highlight major problems in a production chain and focus on these points to set up a welfare programme. This was the case with DANONE: two PhD theses supported by DANONE and hosted and supervised by INRA identified the main welfare problems of dairy cows in France. These points are now included in the DANONE Dairy Animal Welfare Program (Danone and Phyllum 2012),

- Monitor progresses: in the above mentioned DANONE welfare programme, indicators are proposed for the farmers to evaluate the welfare of his/her cows; these are largely inspired by the Welfare Quality® protocols. Similarly, Carrefour asks its egg suppliers to put in place a management of animal welfare with precise indicators and two annual reviews,

- Recommend practices or systems’ design that favour good results according to animal-based indicators of welfare.

From the contacts we had with these three companies, we understood that animal welfare is now part of internal values (ethical attitude) and external values (social responsibility) of these companies.

Slaughter plants: monitoring animal welfare, value added on slaughtering work

Regulation 2009/1099/EC leads to the establishment of a dedicated function at slaughterhouses - the Animal Protection Manager (APM) -, to the definition of standardised protocols, and to a specific monitoring of animals combined with health and quality requirements. A good practice guide is under preparation in France18. Animal Welfare training is being organised. This will contribute to a new value put on slaughtering work by qualifying people (Hochereau, WAFL2014).

Farmers

1- Monitoring and certifying animal welfare

In the UK a methodology was developed for working with existing farm assurance labels (Freedom food, Soil Association, Red Tractor). This initiative - called AssureWel - is led by the University of Bristol, a partner of Welfare Quality®. The full Welfare Quality® protocols were applied in 100 pig, dairy & hen farms to prioritise which indicators to select. Farms are then monitored with indicators very much aligned with the Welfare Quality® protocols. So far, the assessments have been implemented into more than 90% of non-caged laying hens, 95% of pig farms, and 90% of dairy farms in the UK.

18 The good practices have been elaborated by technical institutes with inputs from industries. It was submitted to the Ministry for agriculture who asked Anses to evaluate them.
AssureWel International is currently being established. It will be a collaborative network of certification schemes - including Label Rouge - to work together to share ideas and practical tips on how to implement welfare schemes based on results on animals.

2- Better perception of controls

At present, there seems to be a mismatch between farmers perception of animal welfare which is focused on animal well-being (happy and healthy cow), and farm controls that are focused on resources. As a consequence, controls are perceived as a violence to the farmers work. Moving to inspections, including animal-based indicators, may thus be better accepted by farmers (thesis AC Dereclenne-Lomellini, in progress).

Animals: improvement of animal welfare

It is too early to analyse the entire benefits of introducing animal-based indicators for the animals themselves. Nevertheless, the first results of the AssureWel initiative show a 10% reduction in feather loss over 2 years in the UK.

Consumers and citizens: more accurate information on animal welfare status

Animal-based indicators could be used to better inform consumers and citizens about the status of the welfare of animals. Indeed, articles in Newspapers and TV programs have been released to explain how animal welfare can be assessed\(^{19}\). The EU Commission envisaged the possibility to label products according to the welfare of the animals that they come from (European Commission 2009). Nevertheless, the results of the Welfare Quality® project suggest that animal welfare concerns are bundled with other concerns such as health, the protection of environment, food quality... and should not be considered separately. This is the strategy that was chosen in AssureWel internationals (see above).

Economic impacts

Industries (agro food business): protection against crises and communication

The industries that put in place an animal welfare strategy see several positive impacts for this:

- Prevention of societal crises: the industry protects itself against potential future criticisms if it had not included animal welfare in its strategy,

- An industry may use animal welfare arguments in its advertisements. However, most of the time the living conditions of animals are put forward (e.g. Mac Donald’s guaranties that they use only eggs from free range hens) rather than the actual state of animals because insisting too much on the sensitivity of animals may diminish the consumption of animal products,

- Some labels for animal welfare have been developed, such as the Freedom Food label in the UK. Nevertheless, animal welfare claims are rather embedded into more general labels. This is the case for Lait2Vaches\(^{20}\), a DANONE product which covers both organic production and animal welfare, and use specific animal-based indicators (body condition, lameness) to communicate with consumers.

Slaughterplants: protection of workers and improvement of carcass quality

There are several economic advantages to monitor adequately animal welfare at slaughter:

- Adequate monitoring of stunning protects workers against accidents during the handling of animals (which is primarily a safety issue but has also economic impacts)

\(^{19}\) Arte program on dairy farming ad cows, to which INRA contributed (June 2014)

Reducing the stress of animals at slaughter has a large positive impact on carcass and meat quality (less bruises, less quality defects such as DFD meat, dark veal meat (Lensink et al 2001))

**Farmers added value on their work, higher production**

We expect several impacts on farmers:
- As for slaughter (see above), recognising the importance of animal welfare can add value to farmers’ work,
- Improvements in animal welfare can increase production. It has been well documented that fear of humans results in lower production (lower growth in piglets, lower milk yield in cows). We recently highlighted a positive relation between low aggressiveness between cows and positive emotional state on the one hand, and milk yield on the other hand (Coignard et al 2014).

**Impact 2: Extension to other contexts**

**Transposition of the Welfare Quality® rationale to develop assessment systems for other animal types**

The strategy designed in Welfare Quality® has been used to develop assessment protocols for animal types not covered by the Welfare Quality® project:
- Other farm animals: in the AWIN project assessment protocols are developed for sheep, goats, and turkeys. In France, a protocol was developed for sheep kept indoors and outdoors (project CASDAR Salinov),
- Pets and equidaes: in AWIN protocols are developed for donkeys and horses; protocols for horses were also designed by SLU (Sweden) and WUR (The Netherlands); a protocol for cats and dogs in shelters were developed by the Veterinary university of Vienna,
- Fur animals: the European Fur Breeders Association (EFBA) launch the WELFUR project aiming at designing protocols for the assessment of the welfare of fur animals (foxes, minks) and applying them to all farms related to EFBA (Gaborit et al 2011). The aim of EFBA is to reassure consumers by describing the exact status of animal welfare on fur farms,
- A protocol was also developed for the welfare of dolphins, specifying how to check that dolphins are in a good state.

**Transposition of the Welfare Quality® rationale to develop assessment systems for other contexts**

So far, animal welfare has been dealt with essentially in the context of intensive farming (eg. the Convention for the protection of farm animals adopted by the Council of Europe, 1976). The assessment of welfare with animal-based indicators offers the possibility to address alternative systems. This is exemplified by the present collaboration between DG-Sanco on the one hand and the Slow Food association (that promotes local productions, from small farms, using local resources…) and the European Bank for Reconstruction and Development (that uses criteria which include animal welfare issues to decide to support projects for development).

Although Welfare Quality® did not address directly the transport of animals, its principles were

---

21 [http://www.animal-welfare-indicators.net/site/](http://www.animal-welfare-indicators.net/site/) (EU co-funded project)
applied in the High Control Posts project\(^\text{24}\) aiming at developing an EU animal transport certification system. The project runs in 8 control posts located at the cross roads of important flows of animals transported over long journeys.

Animal welfare protocols have also been used to define key indicators in order to develop Precision Livestock farming (EU-PLF project\(^\text{25}\)). Sensors and models to automatize the recording and ease the interpretation of results are investigated. This will help include animal welfare in the basic principles in the management of farms.

**Extension to international level**

At international level, the results of Welfare quality\(^\text{®}\) and related projects certainly contributed to the formulation of OIE Terrestrial Animal Health Standards. The code for animal health defines common understanding to ease bilateral negotiations between countries in relation to animal exchanges. The draft version of the revised code lists recommendations for the environment and the management of animals (e.g. health management, housing...) and stresses the importance of animal-based indicators to check that good welfare is reached (see frame below).

![Definition from OIE Terrestrial Animal Health Code (text under preparation)](image)

Both OECD, FAO and the World Bank are now taking into account animal welfare issues in their strategies\(^\text{26}\).

### Structure / Project

<table>
<thead>
<tr>
<th>Structure / Project</th>
<th>Role of INRA in the generation of various impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>DG-Sanco</td>
<td>Exchange on progresses and results of Welfare Quality(^\text{®})</td>
</tr>
<tr>
<td>Thesis AC Lomellini</td>
<td>Supervision of the thesis</td>
</tr>
<tr>
<td>ENCAW</td>
<td>Definition of criteria to validate welfare indicators. Comparison of animal-based and resource-based indicators.</td>
</tr>
<tr>
<td>PMAF</td>
<td>Agreement between INRA-UMRH and PMAF to collaborate and inform each other regularly on activities</td>
</tr>
<tr>
<td>Danone</td>
<td>Collaborative project to identify major welfare problems in dairy cows, help in designing welfare program</td>
</tr>
<tr>
<td>Carrefour</td>
<td>Discussions</td>
</tr>
<tr>
<td>Slaughterplants</td>
<td>Help in designing Standard Operating Procedures (within EUWelNet project)</td>
</tr>
<tr>
<td>CasDar Salinov</td>
<td>Design of a protocol to assess the welfare of sheep (with Idele)</td>
</tr>
<tr>
<td>Welfur</td>
<td>Design of the evaluation model for the welfare of minks and wolves and of the software chain to calculate score</td>
</tr>
</tbody>
</table>

---

\(^\text{24}\) http://www.controlpost.eu/joomla/ (project funded by DG-Sanco)
\(^\text{25}\) http://www.eu-plf.eu/
Concluding words

The concern for animal welfare pre-existed the research done on animal based indicators. The indicators designed thanks to this research helped to address the issue of animal welfare in practice and to encourage the dialogue between stakeholders, scientists, and society.

Animal-based indicators are now put forward by many policy-makers, especially at EU level. We foresee an increasing use of such indicators. Indeed, the proposal for official controls on animal health and welfare, food, and plant health mentions explicitly the use of animal-based indicators (European Commission 2013, Article 13-3f). According to the conclusions of the EUWelNet project, a few reference centres for animal welfare could be put in place in Europe to help national competent authorities meet animal welfare requirements. In France, the law for agriculture under discussion at the Parliament proposes such a reference centre to be based in France.

Nevertheless, the use of animal-based indicators should not prevent imposing minimal norms on the environment (especially for the housing of animals). Poor systems like battery cages for hens or narrow veal crates should not reappear on some farms until these are controlled and the poor welfare state of animals is demonstrated. As a matter of fact it has already been demonstrated that a good level of welfare cannot be reached in such systems. This led the partners of Welfare Quality® to conclude that what we need is ‘Ban the bad systems, assess the good ones’ (Miele et al 2011). A pragmatic approach should be taken, combining any measure that can lead to welfare improvements, whether by promoting good environments or by controlling that the results obtained on animals are satisfactory (Main et al 2014). The consequences of such an approach on production should be more closely investigated in order to assess its economic impacts.

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27 Coordinated European animal Welfare Network (financed by DG-Sanco, with the participation of INRA), http://www.euwelnet.eu/euwelnet
# Vector of Impacts

<table>
<thead>
<tr>
<th>Impact dimension</th>
<th>Importance (/5)</th>
<th>Regulations for the protection of animals at the European level (Community Action Plans)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Political</td>
<td>4/5</td>
<td>Enforcement through adapted inspections in France</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Mobilisation in public debate</strong>: Strong and novel messages easily identifiable. The knowledge produced matches a window of opportunity in the public debate. Media coverage is strong toward the general public and professionals. The debate concerns the whole relevant political sphere.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Use in public policy</strong>: Important use at several steps of the political cycle, at relevant territorial scales</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Middle-term impact in diffusion of ideas</strong>: The knowledge may influence a debate with strong stakes. It circulates in scientific and non-scientific circles. Research results are renown and rarely distorted while circulating. The contribution of research to the debate is long lasting</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Stake of the relevant policy</strong>: Limited stakes of the debate. Few economical or environmental aspects. Crisis involving a large population at national and international level</td>
</tr>
<tr>
<td>Economic</td>
<td>1/5</td>
<td>Prevention of crises</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Positive impact of welfare on production</td>
</tr>
<tr>
<td>Social-Territorial</td>
<td>3/5</td>
<td>Inclusion in production schemes (farm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Standard operating procedures (slaughter)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Internal and external values of stakeholders</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Information to consumers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fulfilment of citizens’ concerns</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Can help farmers to be in line with society → maintenance of farms, visits by tourists</td>
</tr>
</tbody>
</table>

![Bar Chart](chart.png)
Annex 1: Members of the Advisory Committee of Welfare Quality® (February 2008)

Eurogroup for Animal Welfare (EUROGROUP)
Dr Sonja van Tichelen - S.VanTichelen@eurogroupforanimals.org
Peter Stevenson – peter.steve.aw@virgin.net

European Society for Agricultural Ethics (Chairperson)
Professor Peter Sandoe - pes@kvl.dk

European Pig Producers Group
Mr Henri de Thore – menez-kamp@wanadoo.fr

European Dairy Farmers Group
Mr Per-Ake Sahlberg - per.ake.sahlberg@v.lrf.se

European Forum of Farm Animal Breeders (formerly FAIP)
Anne-Marie Neeteson – Anne-Marie.Neeteson@effab.info

Global Partnership for Safe and Sustainable Agriculture (EUREPGAP)
Dr Roland Aumueller - dr.aumueller@t-online.de

Federation of Veterinarians of Europe (FVE)
Mrs Nancy De Bryine - nancy@fve.org
Mr Jan Vaarten - jan@fve.org

COPA-COGECA
Mrs Christina Nygaard - chn@agriculture.dk
Mrs Roxane Feller – roxane.feller@copa-cogeca.be

McDonald's Europe
Mr Patrik Holm-Thisner patriarcholm-thisner@se.mcd.com

PAI Group (Product Authentication Inspectorate Limited)
Mr Ian Burton ian.burton@thepaigroup.com

Royal Ahold
Mr Aldin Hilbrands Aldin.Hilbrands@ahold.com

Notes: Dr Andrea Gavinelli (EC Directorate for General Health & Consumer Protection) will act as an ‘Observer’ at meetings of the Advisory Committee.
## Annex 2: Agricultural fairs and stakeholders’ workshops targeted to demonstration during the Welfare Quality® project

<table>
<thead>
<tr>
<th>Country</th>
<th>Venue</th>
<th>Date</th>
<th>Main public</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
<td>National workshop on pig welfare</td>
<td>27 May 2008</td>
<td>Extension services, companies, administration and scientists</td>
</tr>
<tr>
<td></td>
<td>Eurotier (International Agricultural Fair)</td>
<td>11-14 Nov 2008</td>
<td>Producers</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Open day at ID-Lelystad</td>
<td>2008</td>
<td>Cattle sector: farmers, agri. students, advisors and other stakeholders</td>
</tr>
<tr>
<td></td>
<td>Open day ILVO-Animal Sciences, Melle</td>
<td>26 Sept 2008</td>
<td>farmers, producers, scientists</td>
</tr>
<tr>
<td>Austria &amp; Germany</td>
<td>International Green Week Berlin</td>
<td>Jan 2009</td>
<td>Citizens (consumers, processors, retailers)</td>
</tr>
<tr>
<td></td>
<td>Biofach</td>
<td>Feb 2009</td>
<td>Processors, retailers, consumers from the organic sector</td>
</tr>
<tr>
<td></td>
<td>Agraria 2008, Wels/Austria</td>
<td>Sept 2009</td>
<td>Producers, consumers</td>
</tr>
<tr>
<td></td>
<td>Rieder Herbstmesse (Euro Agrar, Euro Tier)</td>
<td>Sept 2009</td>
<td>Producers, consumers</td>
</tr>
<tr>
<td></td>
<td>Local agricultural exhibitions in Austria</td>
<td></td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>Space, Rennes</td>
<td>9-12 Sept 2008</td>
<td>Producers</td>
</tr>
<tr>
<td></td>
<td>Sommet de l'elevage</td>
<td>2-4 Oct 2009</td>
<td>All</td>
</tr>
<tr>
<td></td>
<td>Sommet élevage, Clermont-Fd</td>
<td>Oct 2009</td>
<td>Producers</td>
</tr>
<tr>
<td>Italy</td>
<td>SANA International Exibition of Natural Products-Bologna</td>
<td>11 Sept 2009</td>
<td>Consumers, Retailers</td>
</tr>
<tr>
<td></td>
<td>AgroSud Fair on agriculture and Dairy- Napoli</td>
<td>20 Feb 2009</td>
<td>Producers</td>
</tr>
<tr>
<td>Norway</td>
<td>Matstreif (national food festival) organised by InnovasjonNorge (InnovationNorway)</td>
<td>10-11 Oct 2009</td>
<td>Citizens (consumers, processors, retailers)</td>
</tr>
<tr>
<td>Sweden</td>
<td>Elmia*</td>
<td>22-25 Oct 2008</td>
<td>Farmers, students, retailers, consumers</td>
</tr>
<tr>
<td></td>
<td>Mila</td>
<td>4-7 Feb 2009</td>
<td>Farmers, students, retailers, consumers</td>
</tr>
<tr>
<td></td>
<td>Interfood</td>
<td>17-19 May 2009</td>
<td>Retailers, food processors</td>
</tr>
<tr>
<td>Spain</td>
<td>Expoaviga, International livestock technology exhibition</td>
<td>16 Avr 2008</td>
<td>Producers</td>
</tr>
<tr>
<td></td>
<td>FIMA</td>
<td>24-27 Mar 2009</td>
<td>Producers, Retailers, consumers</td>
</tr>
<tr>
<td>UK</td>
<td>The Royal Show (England)</td>
<td>3-6 Jul 2008</td>
<td>Producers, processors, retailers, food service businesses, equipment manufacturers, consumers, medias</td>
</tr>
</tbody>
</table>
Annex 3 Analysis of the political impact

Assessment of the dimension « Mobilisation in public debate”

<table>
<thead>
<tr>
<th>Arguments</th>
<th>Observation on animal welfare case</th>
<th>Mark (/5)</th>
</tr>
</thead>
</table>
| **Power and quality of the message** | Scientific credibility: Meetings 2007 at European Economic and Social Committee and the European Commission: need to have tools (labelling) for a scientific assessment of animal welfare  
• Change in stakeholders opinions: EU plan, OIE  
• Knowledge circulates also outside academic spheres (in the whole WQ consortium) and was clearly attributable to research contribution | 5         |
| **Agenda-setting of new issues**   | Novelty of research results: up to recently, regulations were based on prescriptive norms on the environment (specially housing). We argued that the focus should be on animals themselves.  
• Timely contribution in a window of opportunity since different labels and certification systems existed in Europe and required harmonisation and it matches a pressing societal concern. | 3         |
| **Size and quality of media coverage** | Large and diverse media coverage through professional press and national press; Website, Newsletter sent to 300 organisations outside the project, 3 Welfare Quality® stakeholders conferences  
• Not much distortion of message in media | 4         |
| **Size and quality of the public debate** | Research results feed the debate: DG-Sanco and OIE took on board the idea of introducing animal based indicators of animal welfare (see EU action plan, reports and actual revision of the terrestrial code of OIE)  
• Public is diverse: Policy-makers, producers organisation, NGOs, Vets, Certification companies were involved in the debate  
• Long-lasting effect on public debate: although Welfare Quality® ended in 2009, there is still large discussions on whether we should use animal-based, resource-based indicators, or both  
• Research ideas consolidates some stakeholders’ opinions. EFSA analysed the relevance and the feasibility of using animal-based indicators (reports in 2012 and DVD to advertised animal-based indicators). At the moment, there seem to be a consensus on the need to ban bad systems and to assess the good ones with animal-based indicators (to check that appropriate results are met)  
• The debate covers the whole sphere relevant for the policy. | 5         |
| **TOTAL Mobilisation in public debate** |                                                                                                      | 17/20 =4/5 |

Contribution of INRA during the step of knowledge mobilization in public debate:

INRA provided expertise and also largely contributed to the debate (contribution to workshops, close exchanges with policy-makers...)

Inra Phase Division - Annex 2

63/83
Assessment of the dimension « Use in public policy»

<table>
<thead>
<tr>
<th>Arguments</th>
<th>Observation on animal welfare case</th>
<th>Mark (/5)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Use at different step of the policy cycle</strong></td>
<td>• Explicit citation of research results in texts (use in policy formulation): Welfare Quality® is expressively cited in the community action plan for animal welfare (2012-2015) and in the motion of the parliament on this action plan (2012). Animal based indicators have already been introduced in the broiler directive in 2007 (Council Directive 2007/43/CE) and in the regulation on slaughter (Council Regulation 2009/1099/EC)</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>• Effect on practices (use in policy enforcement): The Welfare Quality® protocols are freely available so that anyone can use them. They are widely used over the world.</td>
<td></td>
</tr>
<tr>
<td><strong>Geographical scale involved</strong></td>
<td>• The influence is Europe wide (EU strategic plan) and also more recently international wide (OIE)</td>
<td>5</td>
</tr>
<tr>
<td><strong>Novelty of the solution offered by research</strong></td>
<td>• Novel solution as compared to existing ones: Animal based parameters are used with success at slaughter. There are still difficulties to implement animal-based indicators on farms: EFSA is seeking for indicators that could be collected from existing database, with the view of putting in place an animal welfare surveillance system in Europe.</td>
<td>5</td>
</tr>
<tr>
<td><strong>TOTAL Use in policy-making</strong></td>
<td></td>
<td>=14/15 = 5/5</td>
</tr>
</tbody>
</table>

**Contribution of INRA:** There has been a large communication of the results and ideas of Welfare quality® thank to Stakeholders conferences, contribution of policy-makers in the advisory board of the project, close informal exchanges with policy-makers etc. INRA contributed largely to it. At the moment in France, INRA contributes to Anses working group on animal welfare and to the sub-group on animal welfare within the “conseil national d’orientation de la politique sanitaire animale et végétale” (CNOPSAV).
Assessment of the dimension “Middle-term impact in diffusion of ideas”

<table>
<thead>
<tr>
<th>Arguments</th>
<th>Observation on animal welfare case</th>
<th>Mark (/5)</th>
</tr>
</thead>
</table>
| Role of knowledge in the debate | • Animal-based indicators mentioned explicitly in EU welfare plan 2012-2015; also in terrestrial code OIE  
• Possibility for generalisation of use: Not only WQ measures (pigs, poultry, cattle) but in general for all animals  
• The use of animal-based indicators can change the way farms are inspected and may stimulate innovation at farm level | 4 |
| Diffusion of knowledge | • Large audience: both scientific, targeted and large public  
• Some NGOs are afraid that some systems (eg battery cages) may be allowed in the future. We argued that bad systems should be banned and the good ones should be assessed. Criticisms from eg Idel and other organisation close to producers which are afraid to be assessed. Nevertheless, compulsory inspections at present are perceived as violence by farmers and a dialogue based on animals rather than resources has the potential to be more constructive and better accepted.  
• Ideas diffused through training: Animal-based indicators are largely disseminated through education and training. Incorporation of animal-based indicators in SOP at slaughter houses.  
• Welfare quality® protocols or alike are largely used worldwide by many scientists and industries | 5 |
| Lasting of knowledge relevance and integrity of messages | • Sustainable investment of research on the topic: updates of protocols are planned. The Welfare quality Network prolongs Welfare quality with the aim of updating the protocols and extending it to other species  
• Ideas are easily attributable to INRA and its partners: large share of the ownership of protocols  
• Renown of INRA and its partners: Welfare quality® is seen as a reference to develop various projects and schemes | 4 |
| TOTAL Middle-term impact in diffusion of ideas | | 13/15 = 4/5 |

**Contribution of INRA**: INRA contributes largely to the Welfare quality Network (member of the management team, contribution to the Task force on upgrading protocols)
## Assessment of the dimension “Stakes of the relevant policy”

<table>
<thead>
<tr>
<th>Arguments</th>
<th>Observation on animal welfare case</th>
<th>Mark (/5)</th>
</tr>
</thead>
</table>
| **Potential severity and systemic dimension of stakes** | • Animal welfare is a growing concern in Western societies  
  • Public values involved: The work contributes to ethical reasoning on animals. The protocols form a basis for international exchanges (the possibility of an international ISO norm on animal welfare is currently discussed)  
  • Few economic and environmental stakes | 2         |
| **Size of population and politics involved** | • National and international population involved: The impacts can reach competent authorities (inspectors), producers, slaughterplants, agroindustries and retailers, and consumer-citizens.  
  • Insurance value against potential crises, reduction of losses in production (on the farm, at slaughter)  
  • No job stakes | 4         |
| **Societal concern** | • There is a growing concern for animal welfare worldwide (e.g. foie gras boycott)  
  • Contribution of research to consensus-finding: By focusing on results (animal state), one can avoid lengthy discussions about the design of farming system (space allowance, feed, …). Animal-based indicators are especially suited for farming systems which are not conventional | 3         |
| **TOTAL Stakes of the relevant policy** |                                                                                                                                                                                                                                    | =10/15= 3/5 |

**Contribution of INRA**: INRA continues to work on animal-based indicators of welfare, exchange with competent authorities, contributes to DG-Sanco or EFSA funded projects to analyse the practicability of animal based indicators... Recently the comité Ethique INRA-CIRAD started to work on the researches that should be encouraged.
Total score calculation for Political impact

The global « political impact » score is calculated by assigning the weighting factor 1 to the three first dimensions (Mobilisation in public debate, Use in public policy, Middle-term impact in diffusion of ideas) and a weighting factor 3 to the stake of the relevant policy. Using the marks calculated for each of these 4 dimensions based on the arguments presented in the 4 respective tables below, we calculate the final political impact score: 4 out of 5 in the animal welfare case.

<table>
<thead>
<tr>
<th></th>
<th>Score</th>
<th>Coefficient</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobilisation in public debate</td>
<td>4</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Use in public policy</td>
<td>5</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Middle-term impact in diffusion of ideas</td>
<td>4</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Stake of the relevant policy</td>
<td>3</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>22/30=</td>
<td></td>
<td>4/5</td>
</tr>
</tbody>
</table>
## Sources of data

### Interviews

<table>
<thead>
<tr>
<th>Country</th>
<th>Actor type</th>
<th>What actor?</th>
<th>Person interviewed</th>
<th>Person who carried the interview</th>
<th>Date of the interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>Intermediary</td>
<td>RMT</td>
<td>Beatrice Mouneix</td>
<td>Xavier Boivin</td>
<td>10/06/2014</td>
</tr>
<tr>
<td>France</td>
<td>Impact political</td>
<td>DGAL</td>
<td>Jérôme Languille</td>
<td>Isabelle Veissier</td>
<td>28/05/2014</td>
</tr>
<tr>
<td>Europe</td>
<td>Impact political</td>
<td>DG-Sanco</td>
<td>Andréa Gabinelli</td>
<td>Isabelle Veissier</td>
<td>12/06/2014</td>
</tr>
<tr>
<td>Europe</td>
<td>Intermediary</td>
<td>EFSA</td>
<td>Frank Berthe</td>
<td>Luc Mounier</td>
<td>22/05/2014</td>
</tr>
<tr>
<td>World</td>
<td>Impact 2</td>
<td>OIE</td>
<td>Alain Dehove</td>
<td>Isabelle Veissier</td>
<td>Interviewed during EUWelNet (2013)</td>
</tr>
<tr>
<td>France</td>
<td>Impact economic &amp; social</td>
<td>Danone</td>
<td>Camila Garcia</td>
<td>Isabelle Veissier</td>
<td>12/06/2014</td>
</tr>
<tr>
<td>France</td>
<td>Impact economic &amp; social</td>
<td>Carrefour</td>
<td>Remi Lecerf</td>
<td>Luc Mounier</td>
<td>21/05/2014</td>
</tr>
<tr>
<td>France</td>
<td>Impact economic &amp; social</td>
<td>McDonald’s Europe</td>
<td>Patrik Holm-Thisner</td>
<td>Isabelle Veissier</td>
<td>Discussion during Welfare Quality*</td>
</tr>
<tr>
<td>France</td>
<td>Impact sociétal</td>
<td>PMAF</td>
<td>Ghislain Zuccolo</td>
<td>Isabelle Veissier</td>
<td>28/05/2014</td>
</tr>
<tr>
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<td>Impact economic actors</td>
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