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► **Welfare of farm animals:
studying it to improve it**

Bien-être des animaux d'élevage :
l'étudier pour l'améliorer



2022

Stéphane Ingrand

Xavier Fernandez

Etude de cas du département **PHASE** réalisée selon la méthode ASIRPA (Analyse de l'impact sociétal de la recherche) mise au point par INRAE.

Summary

Thirty years of research dedicated to the improvement of animal welfare.

At the end of the 80's, there was little consideration of animal welfare both on farms and in research, at least in France, which was late, compared to other European countries and had little influence in this field at international level. Progressively, researchers deployed extensive studies on animal welfare considering both animal performance and societal concerns, often-facing doubts from stakeholders about the relevance of their work. They contributed to design methods to assess welfare on farms or at slaughter and new practices to improve animal welfare. This research raised awareness of numerous actors on the necessity and the potential benefits of considering animal welfare in livestock farming.

This resulted in substantial impacts on the whole animal sector, either through new regulations, at national and European levels, or through the adoption of new equipment and practices, from birth to slaughter.

Résumé

Trente années de recherche dédiées à l'amélioration du bien-être animal en élevage.

A la fin des années 80, le bien-être animal était peu pris en compte tant dans les élevages que dans la recherche, du moins en France, qui était en retard par rapport aux autres pays européens et avait peu d'influence dans ce domaine au niveau international. Progressivement, les chercheurs ont réalisé des études approfondies sur le bien-être animal prenant en compte à la fois les performances animales et les préoccupations sociétales, faisant souvent face aux doutes des parties prenantes sur l'intérêt et la pertinence de tels travaux. Ils ont contribué à concevoir des méthodes d'évaluation du bien-être dans les élevages ou à l'abattage et de nouvelles pratiques pour améliorer le bien-être animal. Cette recherche a sensibilisé de nombreux acteurs sur la nécessité et les bénéfices potentiels de la prise en compte du bien-être animal en élevage.

Cela s'est traduit par des impacts conséquents sur l'ensemble de la filière animale, soit sous forme de nouvelles réglementations, aux niveaux national et européen, soit par l'adoption de nouveaux équipements et pratiques, sur l'ensemble de la période d'élevage des animaux.

The issues that were to be addressed and the context in which the research was deployed

Until the end of the 1980's, most of the developments in animal production sciences were focused on maximizing production and reducing costs. They neglected the functional consequences for animals, such as the health of the legs and the possibility of moving without pain, the ease of giving birth, the survival of young animals, the possibility of having social relations and expressing natural behaviours such as nest building or foraging, the maintenance of mother-young relations and sensitivity to diseases.

Moreover, this development model also led in some cases to the necessity of eliminating animals considered of no economic value or not adapted to the systems (some of these problems still need to be solved, such as the elimination of males at birth in laying hens). As the general approach was primarily productivity oriented, the quality of animals life was taken into account in a limited way in commercial farms, and as long as it did not interfere with the level of production (Denis, 2015).¹

¹ Denis B., 2015. Ethique des relations Homme/animal, Pour une juste mesure. Edition France agricole, Paris, France, 181p.

Therefore, at that time, the vast majority of veal calves were raised in very small individual pens, fed only with milk replacer, and without social contacts, male piglet castration was done without any pain management and the whole slaughtering procedure caused stress.

The issues to be solved by researchers were then huge, and France lagged behind internationally, both in science and practice. From the late 80's onwards, international meetings provided a scientific expertise to guide the making of European legislation on animal welfare. Very few French scientists were working in this field and France, therefore, had little influence on the international scene.

From the mid-1990's, the scientific community of INRAE, which worked in the fields of ethology or stress physiology, was expanded by several recruitments or thematic shift, most of them in the former scientific divisions of breeding and animal physiology (which lately became the Phase scientific division). This community got organized to coordinate research in the field of animal welfare in the main livestock species (cattle, sheep, goats, pigs, poultry, fish, horses) and develop large-scale projects, some of which included stakeholders.

Inputs. Description of the collaborative research processes that contributed to the impact: main infrastructures mobilized complementary contributions from INRAE and its major public and private partners.

During the last 30 years (1990-2020), this scientific community that will be named from here SCAW, stand for "Scientific Community on Animal Welfare", has addressed animal-based indicators of welfare and positive emotions. They have then identified welfare-friendly practices to be implemented in sustainable farming systems. All along this process, they ensured the promotion of the animal welfare concept in education and training of competent authorities, businesses, civil society and they supported implementation of public policies by providing scientific bases to the decisions.

At the beginning, only a few part of the scientific community considered that the breeding development model should be questioned, or at least revised to take into account its consequences on animal welfare. This difficulty was even greater within the production sectors, for which economic profitability was (and is often still) the major criterion to guide their development. The SCAW which has launched research on the behavior and welfare of farm animals in order to modify the conditions of this breeding, had to face doubts about the relevance of its work and at worst to face deliberate obstruction.

Despite these difficulties, SCAW became during these three decades a leader in the field of animal welfare allowing INRAE to be at the forefront of international research, for all the major farmed animal species.

Beyond the academic excellence of the research conducted by each member of the community, three specific dimensions of the collaborative research processes that SCAW implemented have played a particularly important role in strengthening their research outputs:

- The coordination of a multidisciplinary scientific community through the creation of the AgriBEA French network;
- The involvement in, and the coordination of large-scale European research projects, in connection with stakeholders;

- The organization of the research and development activities with stakeholders to facilitate the transfer of results.

The coordination of a multidisciplinary scientific community

Research on animal welfare needs a multidisciplinary and comprehensive approach, since it does not constitute a discipline per se but has to integrate knowledge from several disciplines (physiology, ethology, genetics, neurobiology, pathology, animal production science, sociology, philosophy...).

The SCAW formed in 1998 the AgriBEA network, with the aim of creating a unique French scientific community by stimulating exchanges between scientists carrying out research on animal welfare whatever their discipline and affiliation within and outside INRAE. AgriBEA was a multidisciplinary network including scientists in biology, animal production science and humanities (sociology, anthropology, philosophy and economy). The development of this academic approach was supported first by INRAE and then by the French Agency for Research (ANR), giving the opportunity to develop and fund original and visible research.

The AgriBEA network federated 160 French members, half from the scientific divisions of INRAE, and half from outside INRAE, mainly engineers from agricultural technical institutes (Idele for ruminants, Ifip for pig, Itavi for poultry and fish production, and IFCE for horses) and staff from universities and schools in ethology, agronomy or veterinary sciences in France. This French network coordinated by the SCAW offered internal visibility of the activities and the expertise of its members, stimulated members to participate in collaborative research and technical projects, and constituted a portal for policy makers needing scientific expertise. It also allowed the federation of different research teams to prepare responses to European calls for international research projects.

The network's strength relied on its diversity in scientific and technical skills, which targets research, policy makers and stakeholders that has led to the following major scientific actions:

- Stimulating exchange of scientific knowledge on animal emotions and welfare during seminars on transdisciplinary topics. For example, the network has been an international leader in developing an innovative approach to study animal emotions based on the cognitive processes as demonstrated in human psychology. It also strongly contributed to promote science-society dialogue, thanks to the participation in its seminars of non-scientists such as animal protection groups (dedicated NGOs) and professionals of the livestock sector;
- Promoting collaborative research projects on science fronts. Thinking about the welfare of farm animals requires an acceptance of the idea that animals are sentient beings, capable of pain (or suffering) and pleasure, but the extent and nature of the emotional register of livestock was not really known. This is why the AgriBEA network adopted among its priorities the need for reflection and research activities on emotional reactions in livestock.

The coordination of large-scale European research projects in connection with stakeholders

The thinking on the animal-based measures of well-being was driven by a European networking project (COST Action 846 "Measuring and monitoring farm animal welfare") partly led by SCAW members. This project found its major achievements in the European project 'Welfare Quality'.

Welfare Quality^R was a research project funded under the European sixth Framework Programme for Research and Technological Development (from 2004 to 2009). This project was, and probably remains, the largest piece of integrated research work carried out on animal welfare in Europe. Dr

I. Veissier, one of the SCAW members, was member of the steering committee of this project which comprised a partnership of 40 institutions in Europe and, from 2006, 4 in Latin America.

The partners were based in 13 European countries as well as Uruguay, Brazil, Chile and Mexico. The main achievements of Welfare Quality can be summarized as follow (Blokhuis et al., 2010)²:

- principles and criteria for good welfare;
- standardized and animal-based measures of welfare;
- harmonized methods for the overall evaluation of animal welfare and corresponding “protocol” documents for cattle, pigs and poultry species;
- improvement strategies and management support or the effective uptake of the assessment systems by stakeholders.

The involvement in development activities with stakeholders

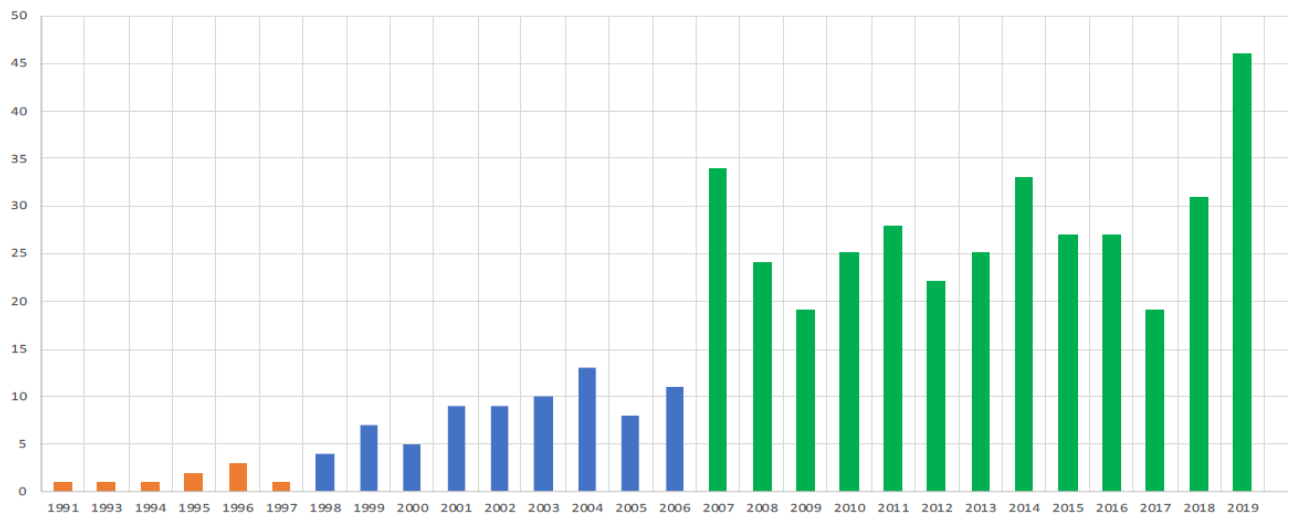
Exchanges with breeders were initiated to build solutions taking animal welfare into account. This led to the creation in 2012 of an animal welfare professional network (Joint Technology Network), led by the technical Institutes. Several national projects (funded by the French Ministry of Agriculture in the framework of its National Agricultural and Rural Development Programme), illustrate this evolution in which a strong collaboration between the SCAW scientists and the technical Institutes promoted new approaches for the assessment of animal welfare in animal husbandry, transport and slaughter by all professional actors.

² Blokhuis, H.J., Veissier, I., Miele, M. & Jones B. (2010). The Welfare Quality project and beyond: Safeguarding farm animal well-being. *Acta Agriculturae Scandinavica, Section A*, 60 : 129-140.

Research outputs

Key research findings

SCAW scientific publications on AW since 1991



The graph shows the strong evolution of SCAW's scientific production from 1991 to the present, with 3 main steps in this evolution (cf. 3 different colours).

Among the multitude of these productions (see figure), we have chosen to identify below some key research findings that illustrate SCAW's contributions to basic concepts related to animal welfare (pain, cognition, emotions):

1. **Boissy A.**, Arnould C., Chaillou E., Désiré L., Duvaux-Ponter C., Greiveldinger L., Leterrier C., Richard S., Roussel S., Saint-Dizier H., **Meunier-Salaün M.C.**, Valance D., **Veissier I.**, 2007. Emotions and cognition: a new approach to animal welfare. *Animal Welfare*, 16(S): 37-43
2. **Boissy A.**, Manteuffel G., Jensen M.B., Moe R.O., Spruijt B., Keeling L., Winckler C., Forkman B., Dimitrov I., Langbein J., Bakken M., **Veissier I.**, Aubert A.. 2007. Assessment of positive emotions in animals to improve their welfare. *Physiology and Behavior*, 92, 375-397.
<https://doi.org/10.1016/j.physbeh.2007.02.003>
3. Botreau R., **Veissier I.**, Butterworth A., Bracke M.B., Keeling L.J., 2007. Definition of criteria for overall assessment of animal welfare. *Animal Welfare*, 16: 225-228
4. **Mormede P.**, Boisseau-Sowinski L, Chiron J, Diederich C, Eddison J, Guichet JL, **Le Neindre P.**, **Meunier-Salaun MC.** Bien-être animal, contexte, définition, évaluation. *INRA Productions Animales* 31:145-162 (2018). [DOI: 10.20870/productionsanimales.2018.31.2.2299](https://doi.org/10.20870/productionsanimales.2018.31.2.2299).
5. **Le Neindre, P.**, Bernard, E., **Boissy A.**, **Boivin, X.**, Calandreau, L., Delon N., Deputte B., Desmoulin-Canselier S., Dunier M., Faivre N, Giurfa M., Guichet JC., Lansade L., Larrère R., **Mormede P.**, Prunet P., Schaal B., Servièrre J., **Terlouw C.**, 2017. Animal, consciousness, awareness, behaviour,

neurobiology, philosophy, adaptation. EFSA-Q- 2015-00390.
<https://doi.org/10.2903/sp.efsa.2017.EN-1196>

6. **Prunier, A.**, Mounier, L., **Le Neindre, P.**, Leterrier, C., **Mormede, P.**, Paulmier, V., Prunet, P., **Terlouw, C.**, Guatteo, R., 2013. Identifying and monitoring pain in farm animals: a review. *Animal*, 7, 998-1010 . [DOI: 10.1017/S1751731112002406](https://doi.org/10.1017/S1751731112002406)

Knowledge flow and intermediaries.

A description of how the impact potential of the research outputs was recognized. The role of intermediaries at different stages along the impact pathway, what challenges had to be overcome to facilitate impact. The contribution of INRAE and that of other partners.

The path by which the research outputs has been transformed into impacts has gone through four main actions in which the SCAW has played a major role:

- The dissemination of research knowledge and the deployment of expertise;
- The contribution to education and training;
- The support for public policy, with a special focus on the creation of the French Reference Centre for animal welfare;
- The contribution to science-society debates.

The dissemination of research knowledge and the deployment of expertise

SCAW members took part to the “Rencontres Animal et Société” organized by the French Ministry of Agriculture (2007-08) that involved public authorities, livestock professionals and animal protection associations. As a direct result, a collective scientific expert report on pain in farm animals was compiled by INRAE at the request of both the French Ministry for Agriculture and the Ministry for Research. Their conclusions were published³ and made public in 2009 :

<https://www.inrae.fr/en/news/animal-pain-identifying-understanding-and-minimising-pain-farm-animals>

SCAW members were part of the scientific expert committee on animal health and welfare of Anses⁴. They produced guidelines for the slaughter modalities of ruminants, pigs and poultry, housing of poultry and pigs (with a focus on environmental enrichment), and recommendations for the development of guides for best practice to ensure animal welfare.

At the European level, they participated in the steering committee of the Welfare Quality network⁵ and in the SCAR⁶ Animal Health and Welfare working group. They have been the main contributors, in addition to philosophers and sociologists, of a second collective scientific expert report on consciousness in farm animals at the request of the European Food Safety Agency (EFSA).

The conclusions were published in 2017 :

<https://www.inrae.fr/en/news/animal-consciousness-new-knowledge>

<https://www.efsa.europa.eu/en/supporting/pub/en-1196> .

⁴ Anses : The French Agency for Food, Environmental and Occupational Health & Safety

⁵ <http://www.welfarequality.net/en-us/home/>

⁶ Standing Committee on Agricultural Research

The contribution to education and training

Together with agricultural and veterinary schools, the SCAW elaborated in 2018 the first online course in French on animal welfare, accessible to a large public and supported by the French Agronomic, Veterinary and Forestry Institute (IAVFF, ex-Agreenium). The first session was very successful with more than 1000 people who attended the whole course (18h). Through the satisfaction survey, 98% of attendees answered that the MOOC fully met their expectations and 92 % that they felt able to put into practice what they have learned. The content of these courses is now being published (Quæ Editions). At the same time, the SCAW is strongly involved in the development of a technical school on animal welfare for scientists, technicians and caretakers, supported by INRAE training service and the scientific divisions.

Support for public policies at French and European levels

Given its proven organization and its recognised activities in research, technical support and education, the SCAW constituted the main architecture of the missions and the main contributor of the French Reference Centre for Animal Welfare created in 2017 by the Ministry of Agriculture. The Reference Center is led by a member of the SCAW, Dr A. Boissy. It aims to share knowledge with all stakeholders involved in animal protection (i.e. animal breeders and holders, veterinarians, animal protection associations, researchers and public bodies), to disseminate results of research and technical innovations, to provide scientific and technical support to all stakeholders, and to establish a resource center for training on animal welfare and protection. The Reference Center brings together INRAE, Anses and the four French national veterinary high schools as well as the R&D actors involved in applied research on welfare (the species-dedicated technical institutes).

At EU level, SCAW members contribute to working groups that prepare scientific opinions for the Animal Health and Welfare (AHAW) panel of the EFSA. For instance, scientific opinion on the risks of poor welfare in intensive calf farming systems (2006), on piglets' castration (2003), on the risks associated with tail biting in pigs and possible means to reduce tail docking (2006). SCAW members also carried out studies for AW indicators and made use of data from existing databases to describe AW levels across Europe farms. Scientific opinions and the conclusions are used by DG-Santé⁷ to refine EU legislative measures on animal welfare. SCAW members also regularly respond to calls from DG-Santé, e.g. on the feasibility and the potential benefits of putting in place reference centres on animal welfare in Europe (EUWelNet project, 2013), and on best practices to limit suffering at slaughter (2016).

Contribution to science-society debates

In connection with animal welfare controversies in slaughterhouses, the SCAW members presented the results of their work to the commission of the Chamber of Deputies in charge of writing a new law for slaughterhouses. They were also involved in working groups and think tanks to prepare the reform of the legal status of animals (Article 1bis of Law No. 2015- 177 of 16 February 2015 of the Civil Code). The SCAW was also a major partner for the Ministry of Agriculture in elaborating its animal welfare strategy for 2016-2020. Several members of the group have been invited by different working groups of the three parliamentary bodies (the National Assembly, the Senate and the Economic, Social and Environmental Council) to report on the state of knowledge in the field of animal welfare and the available resources. Its members are regularly invited to national television and radio programs.

⁷ DG Santé : EU Directorate-General for Health and Food Safety

Chronology

Recherches d'INRAE et impacts INRAE directement impliqué	Réglementation Evénements contextuels
1980-1990 : premières équipes de recherche sur le comportement animal (Jean-Pierre Signoret et Pierre Le Neindre)	1998 : directive (1998/58/CE) relative à la protection de tous les animaux dans les élevages
1995-2021 : mise en place de la caractérisation génétique des bovins sur la docilité et formations des éleveurs /manipulateurs avec France Limousin Sélection et Idèle	2015 : réforme du statut de l'animal dans le code civil, article 515-14
1998 : création du réseau AgriBEA (Robert Dantzer)	2016 - 2020 : première stratégie française pour le bien-être animal (ministère en charge de l'Agriculture)
2005-2010 : projet européen sur l'évaluation du bien-être animal Welfare Quality®	Veaux : 1991 et 2008 : directives sur les conditions de vie des veaux (91/629/CEE, 2008/119/EC). 2006 : avis EFSA sur les risques pour les veaux isolés en logette dans les systèmes intensifs
2009 : expertise scientifique collective INRAE Douleurs animales	Porcs : 1991 et 2008 : directives sur les conditions de vie des porcs (91/630/EEC et 2008/120/EC). 2003 et 2006 : avis EFSA sur la castration et la coupe de queue des porcs ; 2012 : engagement des producteurs pour atténuer la douleur due à la castration (méloxicam) ; 2022 : obligation d'anesthésie avant castration
2011 : création de l'entreprise Bureau ETRE par une ex-doctorante d'INRAE : recherche appliquée, expertises, audits et conseils pour l'élevage, l'abattage et l'étiquetage BEA	Volaille : directive (1999/74/CE) relative à la protection des poules pondeuses ; directive (2007/43/CE) relative à la protection des poulets de chair.
2017 : expertise scientifique collective INRAE Conscience animale	
2017 : création du Centre national de référence pour le bien-être animal	
2018 : création du MOOC bien-être des animaux d'élevage.	

Impacts

An analysis of the impact across the following categories: economic, environmental, social, public policy, health.

Below, we describe 5 emblematic cases of SCAW's contributions to impacts and we identify for each of them, the categories of impacts that were generated. A summary of the different impacts can be found in the table at the end of this section: each of these 5 cases is identified with a specific color that makes the link between the text and the table.

Summary of the impacts

Impact	Welfare evaluation	Veal calves' housing	Piglet castration	Slaughtering process	Cattle docility
Economic	all main livestock species - 16 companies, plus Moypark Beef Orléans - Labelling	- 7 million calves in France/year - 97 M€ of additional value	The issue concerns all pig males	Large part of the agri-food industry - All slaughterhouses in France	- 750 breeders - 300 000 females
Social	Label Rouge' quality sign - corporate social responsibility strategy of companies	More acceptable breeding practices (the end of "le veau en batterie")	Major issue for pig meat acceptance	A new model of slaughterhouse	
Public policy	New regulations at French and European levels	European Directive on veal calves	Anesthesia made compulsory; forthcoming ban of piglet castration		
Health			v	Reducing pain and stress	Reducing accidents

Implementation of 'on farm' methods to evaluate animal welfare

The principles of Welfare Quality have led many professional groups to build and implement their own self-assessment tools for all main livestock species:

- Boviwell in cattle developed by 16 companies, plus Moypark Beef Orléans, which delivers beef patties to all McDonald's restaurants in France and Belgium, with Idele and adopted by Interbev⁸ and CNIEL⁹;
- Ebene in poultry and rabbits developed by Itavi;
- Beep in pigs, co-constructed by IFIP with farmers and technicians from three regions of France and with scientific support of SCAW members and from Anses;

⁸ Interbev: Interprofession Bétail et Viandes

⁹ CNIEL : Centre National Interprofessionnel de l'Economie Laitière

- Moubiene for sheep, developed by Interbev;
- A systematic assessment of goat welfare by the goat industry (Anicap).

Concerning Boviwell, more than 90 technicians from the 16 partners companies followed a one-day training for its implementation. By the end of 2018, 1600 farms had been evaluated with the Boviwell method, and it is still continuing. Each assessment needs from 1h30 to 2 h on the farm.

“The meat and dairy sector plan to evaluate 100% of cattle farms with the method by 2025, to be part of national schemes, to the Charter of good practices and to ‘Label Rouge’ quality sign” (extract from “MoyPark” letter).

Beep is currently being disseminated in France, where the pig farmers are trained to use it. It is positively welcomed by other farmers and their representatives as it was developed with and for farmers. The next step is an electronic application.

Thanks to those evaluation tools, animal welfare is included in the corporate social responsibility strategy of companies. Ultimately, all French farms from all sectors will be the subject to a welfare assessment. The implementation of these evaluation tools has impacts primarily on both social (by giving information to consumers to buy welfare-friendly goods) and public policy levels. Further differentiation in the marketing of “Animal Welfare-labelled” products will also have increasing economic impacts.

For this impact, see the external sources: “Letter from Moypark” about Boviwell and two Journal articles on this subject (Journal Article 1-2 about Boviwell)

Changing the housing conditions of veal calves

Before the work conducted in the 90’s by SCAW members, the vast majority of veal calves were raised in very small individual pens, fed only with milk replacer, and without social contacts. Scientific evidence was provided on the positive impact of improving calves housing and feeding both for animal welfare (expression of normal behaviours, reduction of abnormal activities (tong playing, biting of the walls)) and health, and for the breeders themselves (better growth of the animals, lower veterinary costs)^{10 11}

The impacts of these works were on both public policy and social levels. Indeed, the following changes in practices have been included in the legislation (European Directive on veal calves ‘Directive 91/629/CEE’ and Council Directive 2008/119/EC):

- minimum size of individual pens and need to allow contact between neighboring animals;
- obligation to put calves in groups from the age of 2 months;
- obligation to bring solid food.

These guidelines apply to all calves under 6 months of age, whether intended for veal production or not. There are thus 7 million calves in France per year concerned by this improvement in their housing conditions (according to the 2019 statistics of the French Ministry of Agriculture).

There is also a significant economic impact: for veal calves, the addition of solid feed is accompanied by carcasses heavier by 10 to 20%, which represents a significant gain for breeders. In France, 1.2 million veal calves are affected per year. With an average carcass weight of 143 kg, the weight gain due to solid supplementation is around 17 Mt. With a price of 5.7 € / kg carcass (in 2019 and 2020), this is equivalent to 97 M€ of additional value.

For this impact, no external source is provided since all breeders are concerned by the regulation.

¹⁰ Veissier I, Gesmier V, Le Neindre P, Gautier JY, Bertrand G. The effects of rearing in individual crates on subsequent social behaviour of veal calves. *Appl Anim Behav Sci.* 1994;41:199-210

¹¹ Veissier I, Chazal P, Pradel P, Le Neindre P. Providing social contacts and objects for nibbling moderates reactivity and oral behaviors in veal calves. *J Anim Sci.* 1997;75:356-65)

The ban of male piglet castration

Surgical castration of male piglets intended for meat production is a traditional intervention that was systematic in France until 2008, when a cooperative initiated the cessation of this practice (the Cooperl group). This intervention was done without any pain management until January 1, 2012, when the "French Pork" specifications introduced the need for analgesic treatment to reduce pain. Several reasons motivate the castration of male piglets: to avoid meat quality problems (soft fats unsuitable for meat processing and above all, the presence of undesirable odors known as "sexual odors" during cooking), to avoid problematic behaviour during the fattening period (excessive mounting, aggressiveness) and even the risk of covering young females when males and females are reared together in the same pen.

SCAW members significantly contributed to the drafting of the "European Declaration on alternatives to surgical castration of pigs", signed by many players in the pig industry.

The contribution of SCAW members to this topic had the following impacts:

- They contributed to improve the welfare of pigs thanks to pain management. Nowadays, nearly all animals (compared to 0% before 2011) receive an injection of meloxicam around castration. Although this treatment does not reduce pain during the procedure, it does attenuate it within hours. The introduction of anesthesia, made compulsory from January 1, 2022, in France, will reduce pain during surgery and attenuate it more efficiently during the following hours (social impact).

"The heads of the pork sector have made the treatment of postoperative pain linked to castration compulsory by including in 2011 the treatment with Meloxicam in the VPF specifications, which concerns 98% of pigs reared in France" (extract from "INAPORC" letter)

- They have helped to change French legislation towards stopping the surgical castration of pigs without anesthesia even when the pigs are less than 8 days old (this will be definitely banned from January 2022; public policy impact);
- Ultimately, stopping pig castration should improve growth performance, in particular feed conversion, and therefore indirectly, reduce the environmental footprint (environmental impact).

For this impact, see the external source: letter from INAPORC

Protection of animals at time of slaughter

Close real-time collaboration with the office "Etre"¹², allows efficient transfer of the latest scientific results concerning the reduction of pain and stress in slaughterhouses. This support has been handed out to all slaughterhouses in France and many French slaughterhouses have relied on the knowledge produced by the SCAW to improve their slaughter procedures.

"The "Etre" office is a company solicited by all types of societal actors related to animal welfare issues. Our collaboration with Claudia Terlouw (member of SCAW) has enabled us to support a large number of private partners in the agri-food industry, such as Bigard, Charal, Socopa, Intermarché, Casino, Labeyrie, as well as farms, meat wholesalers, allotment centers and private and public slaughterhouses" (extract from "Office Etre" letter).

A particularly representative example of this impact, at a social level, is the contribution of Dr C. Terlouw to the design of a new slaughterhouse on the site of Bourganeuf. This project was carried

¹² Office "Etre": a design office of researchers and consultants who provide scientific services in the fields of animal behaviour and AW in slaughterhouses

out by an association of nearly 100 breeders from the Limousin region¹³. Dr C. Terlouw's expertise helped in designing this slaughterhouse which minimized causes of stress throughout the whole slaughtering procedure. Amongst others, she contributed to the identification of the optimal site of placement of an automatic perforating stunning system, allowing stunning animals without human presence.

"Through her research, knowledge and scientific skills, Claudia Terlouw has enabled the emergence of innovative concepts in animal welfare. The creation of a circular cattle stall controlling external stimuli (noises, smells, brightness, etc.), the creation of a multispecies stun box, the installation of robotic assistance to stun animals are as many elements in which INRAE, through Claudia Terlouw, participated in a positive and constructive manner" (extract from "Les Viandes Paysannes" letter)

For this impact, see the external source: letters from Office "Etre", and from "Les viandes paysannes" for the Bourgneuf slaughterhouse.

Improving docility and human-animal relationships

The question of animal docility, in particular in cattle, is important because there are too many accidents when handling animals. SCAW members (Dr X. Boivin's team) have developed selection tests for cattle on the basis of docility. They have contributed to the training of 50 trainers who cover the French territory and disseminate concepts and knowledge on the human-cattle relationship¹⁴. Since 1995, around 750 young breeders have been tested within national testing stations. Moreover, the tests carried out on farms have made it possible to characterize the docility of nearly 300,000 females to date¹⁵, thus reducing the incidence of accidents and impacting both at social, health (of breeders) and economic levels.

"Thus, for more than 30 years, the work of INRAE has enabled the Limousin breed to dispose of concrete tools, making it possible to eliminate the animals which would be the most aggressive towards humans" (extract from "France Limousin Sélection" letter).

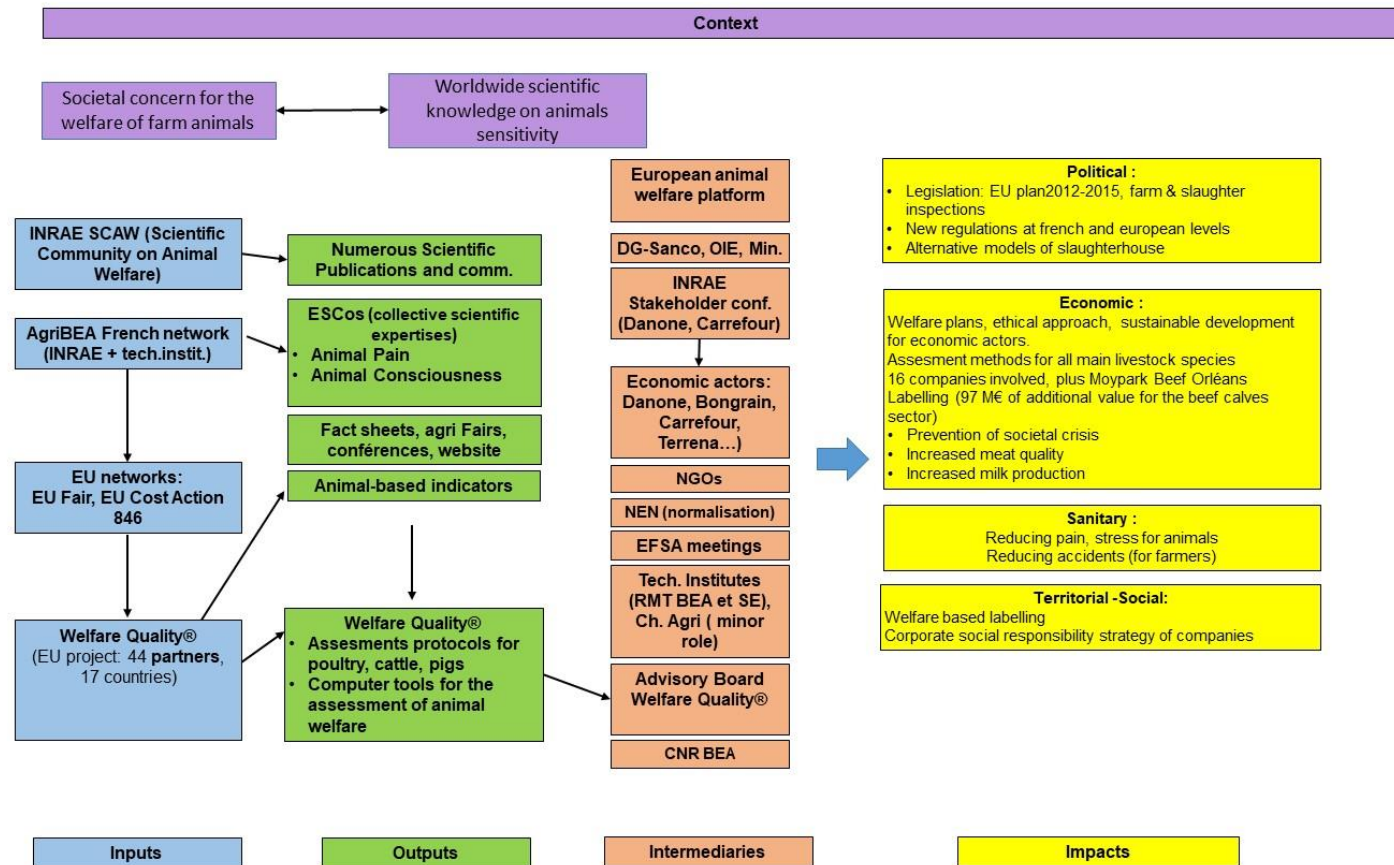
For this impact, see the external source: letters from "France Limousin Sélection" and from Idele (Institut de l'élevage)

¹³ https://www.lamontagne.fr/bourganeuf-23400/actualites/le-pole-viandes-locales-de-bourganeuf-creuse-valorise-les-animaux-en-cherchant-a-leur-epargner-un-maximum-de-souffrance_13822614/14<http://idele.fr/domaines-techniques/produire-et-transformer-de-la-viande/>

¹⁴ <http://idele.fr/domaines-techniques/produire-et-transformer-de-la-viande/bien-et-reanimal/publication/idelesolr/recommends/le-reseau-des-formateurs-manipulation-contention-des-bovins.html>

¹⁵ http://idele.fr/?eID=cmis_download&oID=workspace://SpacesStore/af1a3013-e4eb-4618-9db0-458933d1ea2f

Impact pathway



Impacts by dimension and importance

Impact dimension	Rating of the importance of the impacts on 3 levels: low, medium or high	Comment
Economic	<i>high</i>	Assesment methods for all main livestock species 16 companies involved, plus Moypark Beef Orléans Labelling (97 M€ of additional value for the beef calves sector)
Environmental	<i>None</i>	
Sanitary	<i>High</i>	Reducing pain, stress for animals Reducing accidents (for farmers)
Territorial-social	<i>Medium</i>	Label Rouge' quality sign Corporate social responsibility strategy of companies
Political	<i>High</i>	New regulations at French and European levels Alternative models of slaughterhouse

Main external sources (beneficiaries, or reports) corroborating the impact(s)

About the impact "On-farm evaluation of animal welfare"

- Letter from Moypark about Boviwell
- Journal article 1 about Boviwell in "Réussir Lait"
- Journal article 2 about Boviwell in "La semaine vétérinaire"

About the impact "The ban of male-piglet castration"

- Letter from INAPORC

About the impact "Protection of animals at time of slaughter"

- Letter from Office "Etre"
- Letter from "Les viandes paysannes"

About the impact "Improving docility and human-animal relationships"

- Letter from "France Limousin Selection"
- Letter from Idele (Institut de l'élevage)

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Cette étude de cas du département PHASE a été réalisée selon la méthode ASIRPA (Analyse de l'impact sociétal de la recherche) mise au point par INRAE.

Pour en savoir plus sur la méthode : <https://www6.inrae.fr/asirpa/>

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Photo de couverture : crédit INRAE INRAE / MAITRE Christophe. Engraissement de porcs sur litière de paille. Cette alternative à l'élevage sur caillebotis permet une diminution des émissions de gaz azotés et offre une conduite d'élevage en réponse aux demandes sociétales de bien-être animal, de réduction des nuisances olfactives et environnementales et de qualité des produits.

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