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The effects of PLF on human-animal relationships on farms

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Abstract (maxi 250 mots)

Precision livestock farming induces not only technical and economic changes, but also modifies farmers' work. It affects the nature and frequency of their daily tasks, specifically in relation to animals, and the data available about the animals. It consequently may affect the quality of the human-animal relationship and how farmers perceive their profession.
To better understand these effects, a survey was carried out on 25 French farms raising three different species and equipped with different tools: milking robots and heat detectors for dairy cows, automatic feeders for sows, and housing management and automated weighing systems for poultry. Semi-structured interviews with the farmers were conducted.
The main results showed that there were diverse motivations behind the farmers' decision to install new equipment: some sought better working conditions, others to improve their technical management, yet others were induced by value chain incentives. Most mentioned that their job had become more technical, and the majority was satisfied. Farmers' interactions with their animals had changed and sometimes decreased, with less time spent in their presence or in direct contact. Digital data enabled a different view of animals, focusing on problematic individuals. Some farmers continued to observe their animals and used specific "relational practices" to facilitate work and reduce animal stress, while others delegated decisions and tasks entirely to their equipment. Nevertheless, some farmers noted limits regarding the place of new technologies on a farm, such as the risk of losing their own autonomy or their ability to observe animals and detect problems.

Keywords: (6 maxi) human-animal relationship, precision livestock farming, work, sensor, robot, livestock farmer profession

Introduction

The human-animal relationship is a major issue in livestock farming, both for the farmer and the animal, and reflects how farmers consider the place of animals within their work (Dockès & Kling, 2006). Defined as the degree of closeness or distance between an animal and a person (Waiblinger et al, 2006), the human-animal relationship develops over the course of daily interactions on the farm. It consequently is directly impacted by any change in livestock farming conditions, particularly the arrival of sensors, automated machines and new technology, referred to as precision livestock farming (Hostiou et al, 2014).
With precision livestock farming, automated machines take over certain tasks that were previously done by farmers, directly influencing the human-animal relationship (Schewe & Stuart, 2015). Moreover, the production of new, instant and readily

accessible data on biological parameters and animal behaviour can influence how farmers perceive their animals and modify their direct observations of their animals (Hostiou et al, 2014). Lastly, the development of tasks linked on one hand to computers and new technology and, on the other, to equipment and automated machines, can impact how farmers experience and imagine their professions, and their job satisfaction or dissatisfaction (Cornou, 2009).
However, the new technology does not necessarily create a greater distance between humans and animals; it can enable new relationships to develop (Lagneaux and Servais, 2014). Farmer profiles were defined by Dockès and Kling (2007) based on their closeness with their animals. Several authors (Butler et al, 2012; Schewe and Stuart, 2015; Désire and Hostiou, 2015) furthermore have shown a diversity between farmers with regard to the consequences of precision livestock farming on work organization. This article suggests that diversity also exists between farmers with regard to the consequences of precision livestock farming on how farmers perceive their profession, their animals and the human-animal relationship.

Material and methods

Survey method

We were interested in farmers' social representations, defined by Jodelet (1989) as “a form of socially formulated and shared knowledge intended for a practical purpose". The study of farmers’ representations drew from in-depth, face-to-face, semi-structured interviews. The following topics were addressed: the profession of a livestock farmer (farmer’s motivations, place of animals, definition of a “good farmer”); the introduction of precision livestock farming tools (reasons the farmer acquired the equipment, how the transition is carried out); the management of precision livestock farming (use of data, observation tasks, changes in practices related to animals); the human-animal relationship (definition of a good human-animal relationship, challenges and factors behind a good human-animal relationship in livestock farming, relational practices implemented); precision livestock farming and the evolution of the profession (farmer's representations of changes).
Once the qualitative interview was completed, a closed questionnaire was given to the farmers in which they could note the extent to which they agreed (6 levels possible, from “strongly disagree” to “strongly agree”) to items involving their representations of animals, their profession, precision livestock farming, and what they appreciate about their work. They also were asked to describe their current and past (prior to the introduction of precision livestock farming) relationships with their animals using an ungraduated axis between “very poor relationship” to “very good relationship”.

Choice of species and equipment to study

The aim of the sample was to encompass diverse changes in the relationship between farmers and their animals resulting from the use of precision livestock farming tools. For this, three species were studied (Prim’Holstein dairy cows (DC), gestating sows (GS), and broiler chickens (BC)), all in conventional livestock farming systems.
We used the following criteria to choose the precision farming tools to study: i) tools widely used on farms, and ii) tools differing in terms of the impact they have on animals’ living conditions and farmers’ working conditions. We selected equipment that was either composed exclusively of sensors or was associated with automated machines

(Table 1). Heat detectors for dairy cows (DC) thus function only as sensors. Other equipment combine one or more sensors with one or more automated machines: milking robots (DC), individual sow feeding (ESF or Selfi-feeder) for gestating sows (GS), housing management and automated weighing systems for broiler chickens (BC). The introduction of a milking robot (DC) and automated feeding (GS) led to, or wound up associated with, a new way of managing animals. For dairy cows, this involved a transition from two milkings per day in a milking parlour to cows having direct access to a robot to be milked whenever the cows wish. For gestating sows, group housing replaced individual pens. For broiler chickens, housing management systems have existed for some time. The new feature consists in being able to control building parameters from a distance (remote control using, for example, a smartphone) without having to go to the building (to open ventilation hatches, for example).

Table 1: characteristics of the equipment studied

Species	Gestating sows GS	Dairy cows DC	Broiler chickens BC		
Equipment	ESF, Selfi-feeder	Milking robot	Heat detectors	Housing mgt. system	Automatic weighing system
Main functions of the equipment	Sensor: provides data on consumption Automaton: feed distribution	Sensor: provides data on the quantity and quality of milk produced, frequency of milking, etc. Automaton: milking	Sensor: provides data on the animals' activity: suspicion of heat	Sensor: provides data on building environment parameters and animals' water and feed consumption Automaton: regulates building equipment (ventilation hatches...)	Sensor: provides data on daily growth of chickens Automaton: automatically weighs a sample of chickens
Changes in terms of farmer-animal interactions	The farmer's presence is no longer associated with meals The farmer moves among the animals for interventions (vaccinations, ultrasounds, ...)	The farmer no long sees his/her animals and no longer touches them 2 times a day The farmer may need to move among the herd up to the robot, push certain animals, put down straw, observe, etc.	The farmer can decide to either no longer observe his or her cows, and directly call the inseminator as soon as the sensor sends an alert, or to visually verify before making the call	The farmer no longer moves among his or her animals to operate heating equipment The farmer moves among his or her animals to remove dead birds, and to make occasional repairs.	The farmer can decide either to transmit the data to the PO (and in this case, no longer touch the animals) or to verify by manually weighing a few animals.

Sample and identification of farms to survey

The surveys were conducted in Brittany, the leading livestock farming region in France in terms of numbers of farms. The sample was composed of 25 farms broken down by the three species and equipment presented above.

The size of the livestock unit was a criteria used to select farms because precision livestock farming accompanies increased herd sizes, which can lead to farmers becoming more detached from their animals. Surveys were therefore conducted for each

species in two farm size classes, one above the French average and the other below, without including extremes in either class.
The farmers' contact information was provided by field experts. For dairy cows, the person conducting the survey contacted farmers on a list of 200 livestock farmers identified by their heat detection or milking robot equipment. For gestating sows, only a few names were provided and the farmers surveyed themselves provided the names of other farmers. For broiler chickens, an expert provided some twenty names. Few farmers refused to participate in the survey.

Tallying and analysis method
The interviews with the farmers were recorded. First, a monograph was prepared for each interview summarizing the main topics addressed in the survey. The contents of the interviews and the closed questionnaires were then broken down in a tallying grid which served as a support for an analysis of the thematic content. The principal findings are shown below.
This analysis then enabled the construction of a concise grid regrouping the most discriminating variables. Lastly, a statistical analysis combining a multiple correspondence analysis (MCA) and an ascending hierarchical classification (ACH) was carried out. The active variables selected concerned the representations of the profession, the animal and the human-animal relationship. Three profiles were thereby identified. The explanatory variables concerning representations and practices involved in precision livestock farming were then compared with the three profiles selected.

Results

The characteristics of the livestock farms and farmers in the sample
Table 2 presents the breakdown of the farms surveyed according to the diversity criteria selected.

Table2: breakdown of surveys carried out by species and equipment type

Gestating sows GS			Dairy cows DC						Broiler chickens BC		
< 245	> 300	> 85	> 105	< 25000	> 40000						
ESF	Selfi-feeder	ESF	Selfi-feeder	Milking robot	Heat detector	Milking robot	Heat detector	Milking robot + heat detector	Regul. sys.	Autom. weighing + regul. sys.	Autom. weighing + regul. sys.
3	2	2	1	2	2	4	1	1	2	1	4
8 farms			10 farms						7 farms		

The farms in the sample were slightly larger than the average French or Breton farm, and the farmers were slightly younger than the average French or Breton farmer. Of the 25 people surveyed, 7 were women and 18 men.

Representations of the profession, the animal and the human-animal relationship
The satisfaction farmers say they find in their work and their definition of what makes a good farmer reflect how they view the place of the animal.

What the farmers appreciate in livestock farming activities can be grouped around three features. Some emphasize the animal, the contact, the work with animals. Others mention instead technical features, whether these be technical aspects of animal management, animal genetics, technical monitoring of production or technology at the service of farmers. Lastly, some note the characteristics of their profession, such as being independent, being their own boss, having a real profession, and pleasant working conditions. Diversity with regard to the place of the animal is also found in the farmers' definition of what makes a good farmer. Some farmers define a good farmer as one who takes good care of his or her animals. However, this can mean two different things depending on the individual: taking good care can mean being attentive to the animals' needs so that they are well, or it can mean ensuring that the animals are productive. Other notions are mentioned: a good farmer has strong technical skills, achieves good technical or economic results, or combines animal, technical and economic expertise.

With regard to the representation of the profession, some of the farmers interviewed demonstrated satisfaction with -- or were even passionate about -- their work, while others dwelled on the difficulties involved, and reflected a loss of motivation.

The farmers were questioned about what they thought the human-animal relationship encompassed. It was difficult for most of them to answer this question for two main reasons. One is that they were unfamiliar with the term, the other is that the subject involved a very personal dimension that is not usually discussed in livestock farming. Four farmers thus considered that they did not have a relationship with their animals on the farm (3 BC and 1 GS). It was easier for the farmers to speak about their view of a good human-animal relationship. Most frequently, they mentioned the animal’s welfare, and some spoke of an absence of fear in relation to people, or even a mutual sense of confidence between the farmer and the animals. For some farmers, good production levels reflected a satisfying human-animal relationship. For the majority, a good human-animal relationship renders it possible to work more easily with the animals, regardless of the species. At the same time, they also mention farmers’ well-being, and good livestock farming conditions with equipment.

Three profiles emerge from the statistical analysis of variables involving the representation of the profession, the animal and the human-animal relationship.

Profile A is characterized by a negative image of the profession, experienced as not very rewarding. Farmers with this profile consider that one cannot talk about the human-animal relationship on their farm, and do not enjoy either touching or talking to their animals. These five farmers are all men, working with all three species (2 GS, 2 DC, 1 BC).

Profile B is characterized by a rather positive image of the profession, which they consider rewarding. Independence, a diversity of tasks and technical features are the characteristics which satisfy them most. They associate a good human-animal relationship with animals’ welfare. Thirteen farmers correspond to this profile, 10 men and 3 women, split between the 3 species (3 GS, 4 DC, 6 BC), notably including nearly all of the broiler chicken farmers in the sample (6 out of 7).

Profile C is characterized by the central place occupied by animals. The animals are the main source of job satisfaction for these farmers. They associate a good human-animal relationship with the animals’ absence of fear, revealing through this response their feelings for the animal itself. They enjoy touching and observing the animals and say that animals have a memory more often than farmers from the other two profiles.

Among these 7 farmers, there are 3 men and 4 women, grouping gestating sow and dairy cow farmers (3 GS, 4 DC).

Satisfaction and new practices under precision livestock farming

For many farmers, setting up precision farming tools on their farms was an expression of their desire to work differently: to improve working conditions with robots (work comfort, reduced drudgery, free themselves from the constraint of milking, ...) or to improve their technique and performance with sensors (better identify cows in heat, better adapt feed rations to animals' needs, ...). In addition to these motives, some farmers were encouraged to invest in new technologies by economic and regulatory incentives. We mentioned in the preceding section a shift to group housing for sows, which is both a consequence of automated feed distribution and required by European regulations. On broiler chicken farms, farmers receive a bonus if they provide an accurate estimation of the weight of the birds in a batch. This has encouraged the installation of automated weighing systems, as they can provide data on a greater number of chickens than if the birds are weighed manually.

Nearly all of the farmers surveyed (save for one) expressed satisfaction about working with the new technology. They highlight that work is easier and the equipment allows them more control over animal management, particularly with the provision of data. They furthermore consider that precision livestock farming will prove to be indispensible for farms in the future. Mastering new technologies appears to be a new job skill in a profession which has become more technical. The modern image given to the profession deeply pleased many of the farmers surveyed, who felt less left behind in relation to other professions. A few farmers (4 sow or dairy with milking robot) describe a profession which is in closer contact with animals and state feeling "more like a farmer" in livestock farming conditions where they themselves and their animals are less restricted in their activities. According to the farmers interviewed, the improved working conditions and connectivity of the farming profession renders it more attractive to younger generations. A few, however, expressed some reservations about the tools, which cannot do everything, and noted the importance of also trusting a farmer's eye and gut feelings.

The farmers describe a profession that has not fundamentally changed but which involves new tasks and new daily schedules. They spend more time in front of the computer. They also esteem that they spend either more time or less time with their animals compared to before the installation of the equipment. For many, "observing" animals includes both direct observations, for example by moving among a herd of cows in a shed, and looking at digital data about the animals on their computer. Furthermore, when questioned about what they thought of as a "good animal", some spoke of the "invisible animal" which does not trigger alerts because it poses no problems.

The morning routine illustrates the diversity of practices between farmers. Only 5 farmers (4 of which women) say they start their day by first looking at the animals, while all of the others begin by looking at the computer and the daily alerts before going to see the animals. A range of practices also was identified with regard to delegating a task or a decision to a tool. Some farmers verify the data provided by a sensor. For example, broiler chicken farmers weigh several chickens manually in addition to the automatic weighing system, and dairy cow farmers visually verify that the cow designated by a detector as being in heat is showing the associated signs before calling

the inseminator. The others delegate all responsibility to the equipment. In certain situations, farmers equipped with milking robots continue to manually carry out certain tasks, for example leading a heifer to the robot and attaching the teats in order to accustom the animal to the machine.
The equipment can induce new kinds of contacts with the animals when first set up or when new animals arrive. On dairy cow and gestating sow farms, the arrival of new animals appears to be a key period when opportunities exist for the famer to establish contact with his or her animals and implement habituation strategies (apple juice to tame gilts in quarantine, for example).
Farmer profiles in relation to the profession and the animal also differ with regard to precision livestock farming. Profile A and B farmers distinguish themselves from profile C farmers in their responses concerning precision livestock farming. They most often claim to appreciate working in a modern profession, and consult their computers first thing in the morning before going to see their animals. In contrast, profile C farmers feel that they know their animals better since installing the equipment (milking robots for cows and automated feeders for sows housed in groups). They also say that the human-animal relationship is better. They implement strategies to familiarize the animals with humans and the equipment to facilitate their work.

Discussion

The study showed that the farmers entertain a fairly positive image of precision livestock farming. Some of the farmers surveyed mention a deterioration in the human-animal relationship, such as cited in certain studies (Boivin et al, 2012; Cornou, 2009). However, most are much more positive and say that precision livestock farming, sometimes associated with new farming conditions, has not degraded but has rather contributed to an improved relationship.
The study enabled diverse profiles to be identified which appear to be fairly generic due to their similarity with those identified in a previous study (Dockès & Kling, 2006) on closeness with animals. Precision livestock farming responds to two areas of interest to farmers: animals and technology.
The study covered a small number of farmers and the findings would benefit from being validated on a larger sample. It would be particularly interesting to survey farmers who had encountered difficulties, for example, farmers who installed a milking robot and did not keep it.
Also of interest would be complementary studies on several parameters that could influence changes in farmers' work in relation to animals and equipment like sensors and robots, such as gender (in our sample, women are proportionally more numerous in profile C, focused on the animals), farm size, or farm work force composition (the human-animal relationship is the result of interactions between animals and several people). These parameters can have an influence on both the work and the relationship with animals, and on interest in new technologies.
A comprehensive approach to the human-animal relationship would be multidisciplinary and would combine zootechnical (animal welfare and performance), ethological, ergonomic and sociological approaches (Boivin et al, 2012). Such an approach was not possible within this study but is planned for a new project.

Conclusion and perspectives

Our findings showed broad satisfaction with precision livestock farming among the farmers surveyed. The farmers consider that their work had become easier with sensors and automated machines, and that they had greater control. The majority did not see a deterioration in the human-animal relationship. Instead, they describe a situation in which there are fewer constraints on both themselves and the animals.
The farmers have room to manoeuvre in how they use the equipment; this can be seen particularly in the degree to which tasks are delegated to the equipment, which can be partial or total. Farmers motivated by animals find in precision livestock farming benefits related to animals, while those who are not much motivated by their profession or animals find technical benefits detached from the animals.
New livestock farming conditions such as open buildings instead of individual stalls are providing opportunities to work with animals differently and better. Some farmers implement practices to familiarize animals with people to facilitate later human interventions when getting the animals accustomed to the equipment and over their entire life cycles.
The effects of the development of precision livestock farming on the general public's image of livestock farming was not addressed in this research but also merit being examined in detail as society's image of livestock farming is a decisive factor in the evolution of livestock farms.

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References

Boivin, X., Bensoussan, S., L'Hotellier, N., Bignon, L., Brives, H., Brulé, A., Godet, J., Grannec, M.-L., Hausberger, M., Kling-Eveillard, F., Tallet, C., and Courboulay, V., 2012. Hommes et animaux d'élevage au travail : vers une approche pluridisciplinaire des pratiques relationnelles. In : *Numéro spécial, Travail en élevage*. Hostiou N., Dedieu B., Baumont R. (Eds). INRA Prod. Anim., **25**, 159-168.

Butler D., Holloway L. and Bear C., 2012.The impact of technological change in dairy farming: robotic milking systems and the changing role of the stockperson. R. Agric. Soc. Engl. **173**, 1–6.

Cornou C., 2009. Automation Systems for Farm Animals: Potential Impacts on the Human-Animal Relationship and on Animal Welfare. *Anthrozoös*, **22**, 213-220

Désire, C. and Hostiou, N., 2015. L'Elevage de Précision : quels changements dans l'organisation du travail et la gestion de données en élevage ? In Idele, eds., *4èmes Rencontres Travail*, Dijon, France, 62-63.

Dockès, A.C., and Kling, F. 2006. Farmers' and advisers' representations of animals and animal welfare. *Livestock Science* **103,** 243-249.

Hostiou, N., Allain, C., Chauvat, S., Turlot, A., Pineau, C. and Fagon, J., 2014. Elevage de précision : quelles conséquences pour le travail des éleveurs ? In : Numéro spécial, Quelles innovations pour quels systèmes d'élevage ? Ingrand S., Baumont R. (Eds). INRA Prod. Anim. **27**, 113-122.

Jodelet, D., 1989. Les représentations sociales. PUF

Lagneaux, S. and Servais, O. 2014. De la traite robotisée au raid d'avatars. Incorporation et virtualisation. Parcours anthropologiques **9**, 73-101.

Schewe, R. L., and Stuart, D. 2015. Diversity in agricultural technology adoption: How are automatic milking systems used and to what end? *Agric Human Values*, **32**, 199-213.

Waiblinger, S, Boivin, X., Pedersen, V., Tosi, M-V., Janczak A.M., Kathalijne Visser, E., and Jones, B. 2006. Assessing the Human–animal Relationship in Farmed Species: A Critical Review. *Applied Animal Behaviour Science* **101** (3–4) 185–242.