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BEHAVIOUR MEETING**

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SCIENTIFIC PROCEEDINGS

ANIMAL WELFARE SCIENCE, ETHICS AND LAW

**THEME: MOVING TOWARDS SUSTAINABLE
WELFARE**



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Edited by

Valerie Jonckheer-Sheehy

Foreword

Welcome to all delegates. We are very proud to present to you the proceedings for the Animal Welfare Science, Ethics and Law (AWSEL) stream at the 2017 International Veterinary Behaviour Meeting in Samorin, Slovakia.

The Animal Welfare Science, Ethics and Law Veterinary Association (AWSELVA) and the European College of Animal Welfare and Behavioural Medicine (ECAWBM) values the opportunity this conference provides to promote and develop the AWSEL speciality through the College and recognises the importance of the training structures being introduced. This will provide the driving force for the continuing involvement and improving knowledge base that allows us to influence and direct policy development in the fields of animal welfare science, ethics and law and to provide a level of professional support in those areas. The conference will further strengthen the important role veterinarians strive to play, namely being the leading advocates for the good welfare of animals in a continually evolving society.

We are very appreciative for all those who submitted an abstract and who will present posters or give talks at this congress.

We are also extremely grateful to the Coordinator and Academic Secretary of the AWSEL Stream Valerie Jonckheer-Sheehy and to the Chair of the IVBM organising committee Sagi Denenberg and his whole team for all efforts put in the organisation of the conference.

Additionally, we are tremendously thankful to all sponsors.

Wishing you all a very pleasant congress.

Paul Roger, Chair of the Animal Welfare Science, Ethics and Law Veterinary Association (AWSELVA)

Nancy De Briyne, Chair of the Executive Group of the European College of Animal Welfare and Behavioural Medicine - Sub-Speciality Animal Welfare Science, Ethics and Law (ECAWBM-AWSEL).

Editor's note

I'd like to express my sincere gratitude to the following reviewers for assessing AWSEL manuscripts in 2017: Nancy De Briyne, Pete Goddard, Pol Lynch, David Main, Eva Mainau Brunso, Steven McCulloch, Patrick Pageat and Paul Roger. I greatly appreciate the contribution of these expert reviewers, which was crucial to the presentation and editorial process.

Valerie Jonckheer-Sheehy, Academic Secretary AWSEL 2017

Moving towards sustainable welfare

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Conflict of interest statement: none declared

Both at the public and the scientific community level, animal welfare and sustainability are important keywords in the debate about future developments of livestock production. With regard to the ultimate aim of welfare improvement, the term sustainable may however be interpreted differently, e.g. in terms of long(er)-lasting effects on welfare or of potential interactions with environmental effects of farming practices. In this context, this paper will focus on three aspects: 1) Innovative welfare-friendly housing systems have been developed and investigated for several farm animal species (e.g. 'free' farrowing systems for sows), and are therefore promising for making long-lasting changes. Implementation of such novel housing/husbandry systems in commercial farming is however low and the drivers mainly of economic nature. 2) As shown by intervention studies, e.g. on lameness in dairy cattle, welfare improvement is possible through changes in management and housing environment. Inducing change and making it long lasting seems to be challenging and I will address success and risk factors for actual improvement. 3) Both novel husbandry systems as well as interventions potentially leading to welfare improvements in existing farms may affect the environment and thus the so-called 'ecological pillar' of sustainability. Although our knowledge in this regard is still scarce, possible synergies and trade-offs will be discussed.

Crossing hormonal and behavioural measures to assess positive emotions in pigs

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Positive animal welfare is more than the absence of negative experiences. These studies aimed at investigating whether playing and exploration are linked to peripheral oxytocin and serotonin in pigs and their relationships with tail movement behaviours, to develop profiles assessing positive welfare.

First phase: 10 minipigs of 'Play group' were subjected to play sessions daily for three weeks while 8 minipigs of 'Control group' were not. Second phase: straw was provided to 10 minipigs of 'Exploratory group' for three weeks and not to 8 minipigs of 'Control group'. Blood samples: before play session/providing straw (T_0), at 10 minutes (T_1) and 45 minutes after it (T_2). For 'Control group', blood samples were taken at the same time.

A significant difference was shown for time ($X=3.88$, $DF=1$, $p=0.049$) and for group*time interaction ($X=5.65$, $DF=1$, $p=0.017$) between T_0 and T_1 only in the control group. A positive correlation was found between the increase of oxytocin at T_1 and the tail movement frequency in 'Play group'. The frequency of object-playing behaviour and the social play duration were positively correlated with the duration of tail movements. We found a positive correlation between the serotonin increase of T_1 , tail movement duration and object play duration. In the second study regarding the long-term effect of exploratory behaviour, the mean oxytocin level was significantly higher at T_0 of the 3rd week than the 2nd week in both groups.

These findings could add data about new potential measures regarding the animal welfare assessment in production systems.

Perceptions of the Finnish cattle and pig farmers on animal welfare inspections

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EU regulation (882/2004) sets a demand for conducting on-site animal welfare inspections. We studied how Finnish cattle and pig farmers perceive these inspections. The study was conducted through an electronic questionnaire aimed at randomly sampled 500 Finnish cattle and 500 pig farmers, of which 96 and 105 responded, respectively. An animal welfare inspection had been carried out on the farm of 75 respondents. Factors affecting farmers' opinions on welfare inspection were compared with Mann-Whitney U-test.

We found that less than a third of respondents considered that they had benefited from the inspections and less than 15% considered the inspections promoted the welfare of animals. The inspection situation was experienced more negatively if the respondent had not understood the reason for the inspection, or was not given an opportunity to be heard (Mann-Whitney $p = 0.04$ and $p = 0.001$, respectively). If the inspection was performed without prior warning, respondents often felt that the inspection disturbed the routines of the farm, and that the inspection offended their legal protection (Mann-Whitney $p = 0.02$ and $p = 0.003$, respectively). The degree of information of the requirements of the animal welfare legislation was considered sufficient by 66% of the respondents. Veterinarians were considered as the most important source of the information.

In conclusion, our results suggest that the benefits of the inspections are not easily recognized by the farmers, but with a proper communication their perceptions on the inspections can be enhanced.

Improving welfare in the transport of EU livestock, through guides of good practice

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Conflict of interest statement: none declared.

Thousands of animals are transported daily within Europe and to third countries for slaughter, fattening and breeding. The conditions of transport during these journeys vary a lot. Therefore, the European Commission launched a project to develop Guides of Good and Best practices for transport of livestock. These Guides will cover the whole transport process – from loading until unloading. The guides should facilitate the understanding and practical implementation of regulation 1/2005 on the transport of animals to improve the welfare of animals.

The project consortium consists of 16 members from 10 EU countries, all proactive in the area of livestock transport. It is led by WLR (Wageningen Livestock Research), CRPA (Centro Ricerche Produzioni Animali), FVE (Federation of Veterinarians of Europe), IRU (International Road Transport Union) and Eurogroup for Animals. Support and advice is provided by wide consultations of stakeholders (professionals, scientists, animal welfare organisations).

To start, a comprehensive bibliographical was done to collect and analysed all good practices (report ready). Next, the project started developing 5 European guides for transport of animals, one for cattle, pigs, poultry, horses and sheep. These guides will be ready by summer 2017 and be accompanied by about 20 short factsheets. Later in 2017, the guides will be disseminated across Europe.

The aim of the presentation is to give a short overview and the main findings of the project and present the materials produced. We will give some examples of good and best practices and some of the difficulties encountered in developing the guides.

Qualitative Behavioural Assessment in welfare evaluation of livestock

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Conflict Of Interest Statement: This research was funded by Meat and Livestock Australia

This paper reviews the assessment of on-farm animal welfare in Australian livestock production systems and reports on several developments regarding Qualitative Behavioural Assessment (QBA). Consumer demand and societal concern for animal welfare assurance schemes are increasing yet objective assessments at the farm or market level are neither well established nor regulated for, in Australia. There is a need for measures that are practical, reliable, relevant and meaningful for both producers and society, and that reflect both the physical and emotional state of the animals being assessed. QBA quantifies the behavioural expression of an animal and is one of the few measures that capture positive aspects of animal welfare, such as animals being positively engaged with their environment. We describe the comparison of husbandry management practices using QBA, and include results from the mitigation of pain associated with castration studies under Australian conditions. The use of free choice profiling and fixed-list descriptors is described. Results show that certain descriptors such as *lively*, *active*, *playful*, *distressed* and *indifferent* were most useful in identifying behaviour after castration. The application of QBA as a welfare evaluation tool, in combination with other methods will be presented.

Qualitative Behaviour Assessment of emotionality in horses

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Assessing animal emotion is fundamental to the study of animal welfare. Qualitative Behaviour Assessment (QBA) is based on the assumption that observers can assess details of animals' behavioural expressions using adjectives that reflect the animals' emotional experiences. Our study aimed at assessing how positive and negative short-term treatments would affect the observers' judgements of horses' behavioural expressions. Sixteen horses were each exposed to two positive (grooming, food anticipation) and two negative treatments (food competition, waving a plastic bag) during which they were filmed individually in their home pens. Using a Free Choice Profiling methodology, fifteen treatment-blind observers were asked to describe and score the horses' behavioural expressions. The three main dimensions of behavioural expression explained 84.7% of the variation between horses. Dimension 1 (D1) was described as ranging from 'calm/relaxed/content' to 'nervous/stressed', dimension 2 (D2) as ranging from 'irritated/impatient/angry' to 'frightened/insecure', and dimension 3 (D3) as ranging from 'curious/interested' to 'aggressive/irritated'. Linear mixed-effect models revealed an effect of treatment on the horse scores on all three dimensions (D1: $F_{4,60}=86.90$, $p<0.0001$; D2: $F_{4,60}=69.57$, $p<0.0001$, D3: $F_{4,60}=11.05$, $p<0.0001$). According to our hypotheses, horses were judged as 'calm/relaxed/content' (D1) during grooming and as 'stressed/nervous' (D1) and 'insecure/frightened' (D2) during the plastic bag treatment. In the two food treatments, horses were judged as 'irritated/impatient/angry' (D2). However, horses during food anticipation were also assessed as more 'curious/interested' (D3) than in any other treatment. The results indicate that QBA is a valuable tool to complement animal welfare assessments in situations of both positive and negative valence.

Monitoring of welfare problems in fallen farm animals

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The cause of death of fallen farm animals remains unknown within the standard procedure of animal waste rendering plants (AWRP). However, there are indications of unjustified pain and prolonged suffering in a considerable number of fallen animals due to improper medical treatment and/or the lack of euthanasia at the right time. The aim of our study was to classify/quantify fallen cattle and pigs with pathological signs referred to severe pain and prolonged suffering and to develop a monitoring system for suspicious carcasses in AWRPs. 100 AWRP-trucks with 1070 fallen cattle and 987 fallen pigs were evaluated. We found 13% of cattle carcasses and 21% of pig carcasses with pathological signs indicative of animal welfare problems. Decubitus ulcers were most frequent in cattle and bite wounds in pigs. Based on these results we developed a simple checklist with the five most relevant pathological findings and trained AWRP-drivers to ear tag cadavers with these findings at the farm of origin.

Our monitoring concept was tested by 16 drivers in 54 trucks with 732 fallen cattle and pigs. 34 carcasses were identified as suspicious according to our checklist. All relevant carcasses were correctly detected by the drivers. However, 9 carcasses were marked false-positive. We conclude that there is a substantial animal welfare problem in fallen livestock. Our monitoring concept produces reliable results with low additional workload. Intensive training of farmers with regard to proper treatment of moribund animals may help to reduce the number of fallen stock with obvious signs of unjustified suffering.

Multimodal analgesia for piglet castration

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Each year, millions of piglets are castrated to minimise boar taint and aggression. The procedure is painful and legislation mandates that piglets be provided with analgesia. Previous work has demonstrated that NSAIDs do not provide sufficient post-operative analgesia.

A pilot castration study in piglets examining pre-emptive buprenorphine (0.04mg/kg) and butorphenol (0.2mg/kg) suggested that buprenorphine was less sedating. The objective of this study was to assess the efficacy of buprenorphine as an analgesic when given alone or combined with meloxicam (0.4mg/kg) and/or a topical lidocaine-based analgesic prior to castration, using validated behavioural scoring techniques and a novel Piglet Grimace Scale. Twenty-five litters of 5 day old piglets (n=150) were used and boar piglets within a litter were randomly assigned to one of ten possible treatments: buprenorphine + meloxicam + maxilene-castrated or uncastrated, buprenorphine + meloxicam- castrated or uncastrated, buprenorphine + maxilene- castrated or uncastrated, meloxicam + maxilene- castrated or uncastrated, saline-castrated, or sham-castrated (n=15 piglets/treatment group). Injections were given intramuscularly 20mins prior to castration. Piglets were video recorded for 1h pre-procedure, immediately post-castration for 8h and at 24h post-procedure (10h total). Twenty-one behaviours were scored continuously for the first 15mins of every hour by observers blinded to time and treatment. Data was analysed using a mixed model ANOVA with repeated measures and a post-hoc Tukey test.

Castrated piglets were significantly less active 3h and 4h post-castration ($p= 0.0007$ and $p<.0001$, respectively) while uncastrated piglets had unvarying levels of activity. The effect of opioids on castration behaviours will be discussed.

Comparing the welfare of calves after caustic paste and hot-iron disbudding

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We summarise here two experiments studying differences in behaviour and healing in calves disbudded either with a caustic paste (PASTE) or hot cauterisation (CAUT). All calves were disbudded under sedation and were administered ketoprofen (3 mg/kg) for a period of one (NSAID1) or 5 (NSAID5) days. CAUT was performed under local anaesthesia. In experiment 1 we followed calves milk-feeder usage and activity before and one week after disbudding, we took daily thermal forehead images to illustrate blood circulation and healing (25 CAUT and 23 PASTE calves) and we registered threshold in the ear-pinch test. In experiment 2 calves were disbudded (method/side) and biopsies were taken under sedation and local anaesthesia 2 days and 2 weeks after disbudding from both sides to illustrate histological healing (n=16 calves).

PASTE calves had an immediate 2-hour increase in blood circulation after which it decreased, the CAUT calves showed the opposite. Ear-pinch threshold was lowered for both treatments 5 days after disbudding ($p < 0.05$ for all). At 2 days deep dermal necrosis was visible in all PASTE calves but not in CAUT calves and at 2 weeks granulation tissue occurred in all CAUT calves but only in one PASTE calf. NSAID tended to decrease daily overall activity ($p < 0.06$). Treatment*disbudding interactions were found for the mean number and bout length of lying behavior: NSAID5+CAUT calves lay down more often than the NSAID5+PASTE calves did, however NSAID5+PASTE calves had longer lying bouts than NSAID5+CAUT calves. CAUT calves drank milk rations quicker than PASTE calves ($p < 0.05$ for all).

We conclude that NSAIDs work differently in relation to chemical and mechanical burns. Caustic paste causes more severe lesions that take longer to heal than the hot cauterisation. NSAID: Non-Steroidal Anti-Inflammatory Drug

A multiparametric approach to discriminate the impacts of different degrees of invasiveness of surgical procedures in sheep

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Traumatic situations in animals induce responses including pain, expressed through behavioural and physiological pathways such as inflammation, oxidative stress, hypothalamic-pituitary-adrenal axis (HPA), and autonomic-nervous-system (ANS). As some of these systems can also be activated during excitement and situations with a positive valence, their use as a means to assess pain response is difficult. We explored i) how these pathways change in sheep exposed to various degrees of invasiveness of surgical procedures despite a therapeutic regimen and ii) whether a multiparametric analysis that combines information from these five pathways enhances the discrimination between these situations, and estimates the relative importance of these pathways in the response.

We used 24 adult sheep divided into four treatments: Control (C, no fasting, no anaesthesia, no surgery), Sham (S, fasting, anaesthesia, no surgery), Rumen Canulation (R, fasting, anaesthesia, rumen cannulation), and Rumen-Duodenal-Ileum cannulation (RDI, fasting, anaesthesia, cannulation of the rumen, duodenum and ileum). Sheep' responses were measured for five days after surgery. All animal procedures were approved by the Regional Ethics Committee for Experiments on Animals.

When considering each behavioural or physiological pathway independently, discrimination between treatments was acceptable, its sensitivity (Se) ranging from 0 to 100%, and its specificity (Sp) ranging from 62 to 100%. The multiparametric analysis gathering information from the five pathways enhanced the effectiveness of discrimination between treatments (Se, 50-100%; Sp, 82-100%), and gave additional information on the relative contribution of each pathway to the global sheep response. Sheep global response was higher when exposed to a surgery, and increased with the surgery invasiveness. This response relied mostly on inflammation (absolute correlation for haptoglobin, 0.89), HPA (cortisol, 0.85), and behaviour (Antalgic postures, 0.85).

The multiparametric approach seems to be a promising tool to discriminate between different degrees of invasiveness of surgical procedures.

Applying Scientific Advances: Where Does Our Animal Welfare Knowledge Come From? Not Always From the Scientists

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Conflict of interest statement: none declared

For many years, the assumption in animal health and welfare policy has been that scientists working in institutions are best placed to provide the technical solutions to our policy challenges. However, there is a growing interest in agricultural innovation generated through practice-led collaborative learning processes which involves but is not led by scientists.

Using the egg-laying hen sector as a case study, the EU-funded HENNOVATION project has been testing mechanisms to facilitate practice-led innovation in sustainable animal welfare through development of 'innovation networks'. More than 15 innovation networks, involving producers and laying-hen processors, have been mobilised in UK, Sweden, Netherlands, Spain and Czech Republic. These were supported by a variety of actors including animal welfare scientists, veterinary surgeons, technical experts and food chain actors. The networks have tackled a range of technical challenges including feather loss, red mites and handling end-of-lay hens. The innovation process was developed and tested through action research led by a team of expert facilitators. The process included the following steps: mobilising a network, identifying a problem, generating an innovative idea, planning and resource mobilisation, trialing the innovation, implementing/upscaling and finally dissemination/embedding. Successful networks involved the right people, identified common goals, focused on areas that can change, provided sufficient resources, learned by doing, used knowledge from within and outside the network and crucially, expertly facilitated.

In focussing on collaborative approaches to innovation, this project contributes to the integration of science and practice leading to solutions designed to deliver lasting change in animal welfare practices.

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The paediatrician model in veterinary ethics: On the „internal morality“ of Austrian veterinarians and their attitudes towards killing companion animals

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Introduction

Since the first publications in veterinary ethics the idea has been dominant to learn from medical ethics in the human field. Amongst others, one major idea was that veterinary practice resembles paediatric care and should therefore aim to apply the “paediatrician model” (cf. Rollin 2006). In brief, the idea of this model is to always act according to the presupposed interests of the (animal) patient. The paediatrician model is often considered a main corner-post of the “internal morality of medicine”, a term coined by H. Brody and F. G. Miller (1998). In a very general way, talking about an internal morality in medicine means to “[...] assert that medicine is not a morally neutral body of knowledge and technique. Rather, physicians [and other medics; H.G.], by virtue of becoming socialised into the medical profession, accept allegiance to a set of moral values which define the core nature of medical practice. [...] The professional integrity of physicians is constituted by allegiance to this internal morality.” (Brody/Miller 1998, 385f.). The aim of the presentation is to elaborate whether the paediatrician model is of major importance to Austrian veterinarians and part of their internal morality on an empirical basis.

Methodology

Starting from an empirical survey that we carried out on „Attitudes of Austrian veterinarians towards euthanasia in small animal practice” (Hartnack et al. 2016) the talk will elaborate whether and how Austrian veterinarians apply the paediatrician model. A questioner was sent out in November 2012, which included nine euthanasia scenarios, 26 normative and descriptive statements regarding euthanasia and demographic data. The questionnaire was sent to members of the Austrian Chamber of Veterinary Surgeons (n = 2478). We received 517 sufficiently completed questioners.

Main results

The argument will be put forward, that – although the paediatrician model is influential – other ends play a major role in the veterinary profession and the internal morality.

Conclusions

Against the background of conflicting responsibilities of the veterinary professionals it will be concluded that the paediatrician model cannot serve as the single source for the internal morality of veterinarians. An alternative model, which takes the complexities of the veterinary professionals’ life into account, will be presented.

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A regulatory understanding of informed consent

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Veterinary informed consent is the contractual arrangement between professional and client, its bioethical legal model serves to ensure the proposed intervention is understood and agreed. Veterinary consent has received minimal investigation, and analogies to human medicine are problematic considering the substantially different legal status between persons and animals. The professional, rather than legal, component of consent is governed by regulators and disciplinary cases involving failed consent can provide novel insight into understanding the consenting process.

The archives of the RCVS Disciplinary Cases from 1891-2014 were manually searched for records containing the word “consent”. Exclusion criteria were: cases not relating to ‘informed’ consent or providing no new information about consent. The remainder were analysed to determine learning points from a professional regulator’s perspective.

Since 1949, 30/401 records contained the term “consent”. 19 records were excluded and from the remaining 11 cases substantial detailed novel information was elucidated about consent which was divided into 6 broad categories: provision of information, alternative treatment options, duty to undertake procedures, use of off-licence drugs, the consent form, and client coercion.

This novel methodology, in both veterinary and human medicine, of disciplinary data interrogation, revealed new insights into a regulatory understanding of informed consent. It revealed a new understanding which enhances the client/veterinarian bond, promoting animal welfare. Implementation of this information should serve the public and veterinary team interests. The theoretical framework of the bioethical legal model of veterinary consent may need to be realigned in light of these outcomes to reflect the difference to human medicine.

A thematic analysis of veterinary journal author guidelines in regards to the use of animals in research

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Veterinary journals publish research undertaken on animals that may have caused welfare compromise for the advancement of veterinary medicine. The ethical approval of such research occurs at various critical control points. There are no internationally agreed and implemented standards of research ethics to control animal welfare; this results in veterinary journals having variable standards of ethical control. This study undertook a thematic analysis of veterinary journal 'author guidelines' to elucidate consistencies and deficiencies in standards with regards to the use of animals in research.

137 veterinary journals were identified from the Web of Science database. Author guidelines were obtained from individual journal websites and evaluated using a thematic analysis method. This yielded 7 major themes of ethical control of animal welfare in journals.

The analysis highlighted themes that were consistent across journals and disparities between animal welfare and published frameworks. Findings emphasised the importance of rigorous journal requirements promoting welfare standards during institutional ethical approval and editorial review. Ethical approval ensures that research complies with relevant legislation and guidelines, a harm-benefit analysis and/or owner consent has been obtained. Editorial review presents another opportunity to regulate animal welfare, ensuring that research is compliant with relevant guidelines.

Journals represent a critical control point in the regulatory control of animals used in research. Consistency across journal guidelines can promote the welfare of animals beyond national and international jurisdictional requirements. This study highlighted ways in which animal welfare could be further consistently enhanced across all journals to improve welfare without requiring slow legislative change.

One health – many patients? Ethical considerations regarding the status of the animal as patient

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Conflict of interest statement: none declared.

The holistic understanding of health is a crucial idea of *One Health* and *Comparative Medicine*. Both concepts aim at bridging human and veterinary medicine and the transfer of medical knowledge. The aim of this talk is to analyse the possibility to transfer knowledge from human biomedical ethics to veterinary ethics to reveal the nature of moral problems and facilitate ethical decision-making in veterinary practice. Based on the concept of *patient* in human medicine and its normative implications, the concept of *animal patients* in veterinary medicine will be analysed. As we will argue, the crucial similarity is to aim at health-related interests in both fields. Focussing on such interests seem to be the unquestionable goal in human medical contexts. However, since these interests are not always the (exclusive) purpose of clinical interventions (e.g. in interventions to maintain productivity in livestock, culling, some cases of euthanasia) criteria will be explicated that allow an assessment whether an animal can rightly be referred to as patient. Finally, moral implications and the limits of transferring the concept of patient to animals will be investigated. Therefore, the famous four principles of biomedical ethics by Beauchamp and Childress will be used. The transfer of the *non-maleficence* and the *beneficence* principle is widely uncontroversial, whereas the principles of *justice* and *autonomy* open a number of moral questions regarding the concept of *animal patients* that will be addressed.

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Assessment of housing systems and equipment for farm and pet animals in Austria

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Conflict Of Interest Statement: none declared.

A huge variety of housing systems and equipment for animals is available. Therefore, it is challenging for owners of livestock and pets to know what conforms to animal welfare. The Specialist Department of Animal Husbandry and Animal Welfare is an independent institution established under the Austrian Animal Welfare Act. It reviews and evaluates housing systems and equipment for farm and companion animals.

Producers or traders make an application for assessment of specific products. The department team consisting of a lawyer and a veterinarian assesses the products according to scientific and legal welfare requirements. The assessment is obligatory for novel products, it is optional for all others.

The assessment starts with inspection of the product and the submitted documents. In a first step, we review available data, e.g. scientific studies, according to animal welfare. An inspection of the product under practical conditions is always part of the assessment. Where further data on animal welfare is required we collaborate with accredited testing centres, e.g. the Institute of Animal Husbandry and Animal Welfare of the Vetmeduni Vienna. We will present some examples of actual assessments proceeded so far (N=54, farm animals=20, pets=34).

In case of a positive evaluation the product is awarded with the label “animal welfare compliant pursuant to article 18 Austrian Animal Welfare Act” combined with compulsory regulations of use. This certification of conformity increases legal certainty and facilitates the enforcement of animal welfare requirements. The assessment of housing systems and equipment by an official authority contributes to making animal welfare sustainable.

Pig welfare: challenges and opportunities

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European pig producers face several critical challenges from an animal welfare standpoint, including castration of male piglets, tail biting and welfare problems of farrowing and lactating sows. Surgical castration of male piglets is still a common practice in many European countries and anaesthesia, and analgesia are not always used. Soon, pig producers will have to choose between three alternatives: producing intact males, using Immuno-castration or using surgical castration with anaesthesia and postoperative analgesia. Tail-biting is a multifactorial problem of growing pigs with severe negative consequences for the welfare of the animals and the economic profitability of the farm. Ensuring an adequate stocking density and providing enrichment material that satisfies the behavioural needs of the pigs are the two most important preventative strategies to reduce the risk of tail biting. These strategies will become even more important in the future as the European Union plans to take further measures to enforce the current ban on routine tail docking. Farrowing and lactating sows experience several welfare problems, including pain and fatigue caused by farrowing and movement, and behavioural restriction created by farrowing crates, which are widespread in many European countries. Changes in routine husbandry (including the use of analgesia to reduce pain caused by farrowing), as well as changes in the housing systems, are among the strategies to improve the welfare of farrowing and lactating sows. These strategies must be assessed considering not only their effects on the welfare of sows but also on piglet viability. Previous research on pig welfare in the EU has shown that knowledge-related bottlenecks play an important role to reduce the implementation of improvement strategies. A bottom-up approach such as the one recently developed in the project Hennovation is likely to be much more efficient regarding effective knowledge exchange between producers and advisors.

From proposal to legislation: minimum standards for European farm rabbits

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The rabbit is a frequently farmed species in the EU. Morbidity and mortality constitute major problems in rabbit farming, especially due to respiratory and gastrointestinal diseases. Rabbits are often kept in housing systems which cannot meet the needs of the animals. Contrary to other main farmed species in the EU, rabbits are not protected by species-specific legislation.

The Council of Europe started to develop recommendations for rabbit welfare but never managed to finalise them. Many organisations have since been calling to the EU to draft minimum standards for rabbits. In 2016, Member of the European Parliament (MEP) Stefan Eck issued an Own-Initiative Report 'Minimum standards for the protection of farm rabbits', to propose such standards for farmed rabbits.

Several organisations spoke out for or against the report, and many MEPs proposed amendments to the report. The report was voted in the European Parliament on Committee level in January 2017 and in a plenary meeting in March 2017. In the end, the report was adopted, including a call to develop minimum standards. Also the Federation of Veterinarians of Europe (FVE) brought together a large number of experts specialised in the welfare of rabbits, from different EU countries, to produce an overview of the critical issues regarding rabbit farming including possible solutions.

The aim of the presentation is to use this report to illustrate how the process of the European legislative process works and what its limitations are, with the focus on the minimum standards for farm rabbits in the EU.

Rewilding Europe – who should be responsible for animal welfare?

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Conflict Of Interest Statement: The author is Chair of the Wild Animal Welfare Committee but the views expressed are personal ones and do not necessarily reflect those of the Wild Animal Welfare Committee.

The rewilding debate focusses on biodiversity and ecosystem processes through the reintroduction or support of species previously resident in a region or country. However, it is not clear that individual animal welfare features in debates about the desirability of rewilding. Restoration of a chronologically arbitrary ecological balance seems attractive and beneficial to some, but may overlook individual animal welfare “costs”. These include both proximate concerns such as post-release survival, and longer-term impacts on both the released animals and those with whom they interact directly or indirectly – including potential prey. These costs, increasingly assessed during conservation activities, need equal, if not greater, consideration during rewilding. While reintroductions revolve around populations, animal welfare relates primarily to the individual.

It is not clear who has (or should have) responsibility for evaluating and arbitrating on the welfare impacts of rewilding. Welfare cost-benefit analysis shows benefits and costs are shared unequally. If the benefit is primarily to those promoting the reintroduction and the costs primarily to the wildlife species, very stringent tests should be imposed to safeguard the welfare of the (re)introduced animals and those with whom they interact. For wild species, an approach incorporating “naturalness”, with respect for the telos of the individual, is an important way to consider their welfare. This should have a greater prominence but complement consideration of biological function (ability to “cope”) and mental aspects (“feelings”). Ultimately, who is to be the guardian of the welfare of wild animals and how can guardianship be exercised during rewilding?

Can maternal Immunoglobulin G be quantified in calf saliva?

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Good colostrum management and prevention of Failure of Passive Transfer (FPT; serum IgG at 24-28 h < 10g/L), is of major importance for calf welfare. To enable surveillance of FPT prevalence in herds, serum has been used, in spite of blood sampling being a relatively invasive technique which in some countries must be done by a veterinarian. Given that maternal immunoglobulin G (IgG) transfers from serum into calf saliva and its levels correspond to that of serum, saliva may represent a non-invasive medium from which FPT-status of calves could be evaluated.

To investigate this, we used 20 Norwegian Red dairy calves (age 1-3 d) that were housed in single pens and fed 4 L of colostrum within 4 hours after birth using a teat bottle. We used cotton swabs held into the calves' mouth for 1 minute to obtain saliva and a syringe to compress the saliva into tubes for storage. Milk feeding was retained at least for two hours prior to sampling. After collection of saliva, blood was drawn from the jugular vein. IgG was determined with Single Radial Immunodiffusion. Mean (\pm SD) serum and saliva IgG was 32.1 \pm 11.94 g/l, and 0.2 \pm 0.11 g/l respectively. Of the saliva samples, 6 had levels below the lowest detection limit (0.1 g/L). Spearman Rank correlation revealed a strong positive correlation ($r=0.7$, $p<0.001$) between IgG in serum and saliva. The results encourage further studies on the reliability of saliva IgG to detect calves with FPT.

Implementation of animal based measures within an animal-welfare labelling scheme for steers

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Conflict of interest statement: none declared.

Animal based measures (ABM) have been implemented in Austria for the first time within the Animal Welfare (AW) Label "Tierschutz-kontrolliert" applied to "ALMO®" steers. The goal of this on-farm study was to describe the implementation of ABM during auditing, to evaluate the prevalence of ABM and to investigate potential correlations with resource based measures (RBM).

Inspectors trained to sufficient agreement in assessing ABM audited 190 farms regarding both RBM and ABM. For this study 120 audits (1784 steers) were analysed.

The median prevalence's (%) of all ABM of farms, analysed in detail (n=120) were 0.0. The most common parameters were: "dirtiness" (Q3: 15.0 %), "ocular discharge" (Q3: 4.7 %) and "loose faeces" (Q3: 2.8 %). Additionally, on few farms the following three parameters had highest maximal values: "hairless spots on front leg" (Q3: 0.0 %), "overgrown claws" (Q3: 0.0 %) and "hairless spots on head, neck, shoulder or back" (Q3: 0.0 %). "Hairless spots on front legs" were significantly higher in cubicles with rubber mats (Q3: 2.63; n=24), than in straw systems, where they were never observed (deep litter: p=0.004; n=31; straw flow system: p=0.015; n=21). Space allowance correlated negatively with "dirtiness" (-0,356; p=0.007) as well as "hairless spots on the hind leg" (-0.349; p=0.008). "Loose faeces" occurred only during the autumn-winter period (Q3: 6.25 %; n=75).

Compliance with RBM did not reflect a lower prevalence of ABM, therefore, the evaluation of RBM alone during auditing is insufficient, only the combination with ABM reflects an accurate measurement of AW.

The effect of milk allowance and weaning method on the behaviour of dairy calves

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To foster the transition to ruminants, dairy calves are conventionally fed low milk rations which may result in prolonged hunger. Furthermore, calves are often weaned off milk, without considering individual ability to feed on solid food.

Using generalised linear mixed models, we investigated the effects of two feeding regimes differing in milk allowance before weaning and weaning method on number of unrewarded visits to the milk feeder and concentrate intake of female calves before and during weaning. For “individually weaned” calves (n= 9), milk allowance of 6 litres/day before weaning was reduced based on each calf’s increasing consumption of concentrate during weaning. “Ad libitum calves” (n= 8) were allowed ad libitum milk for 28 days before being weaned in 49 days irrespective of individual concentrate consumption.

Time from birth until end of weaning was similar in both treatments (p= 0.459) but varied greatly between individually weaned calves (55-112 days). Before weaning, individually weaned calves, i.e. calves with restricted milk access, engaged in more unrewarded visits/day than ad libitum calves. During weaning, the number of unrewarded visits of individually weaned calves decreased, while it increased in ad libitum calves compared to before weaning (p< 0.0001). Concentrate consumption increased in both groups. However, both before and during weaning, it was higher in individually weaned calves (p< 0.0001).

We conclude that calves in both treatments showed signs of prolonged hunger before and/or during weaning. This may be solved by feeding ad libitum milk before weaning and by weaning based on individual concentrate consumption.

Does animal welfare influence dairy farm performance?

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Within the EU, the project of Welfare Quality® (WQ) provides a reference tool for assessing welfare in different animal species, including dairy cattle. It is based upon the principle of the five freedoms, but scored as 4 as overlapping appears. It starts at the assumption that animal welfare should include the 4 principles of: good feeding, good housing, good health and appropriate behaviour. These 4 principles are defined by 12 criteria responding to the farms measurements.

The present research was designated to assess the relationship between on-farm welfare and production and reproduction performance (as measured by 305-day normalised milk yield and calving to conception interval) in dairy herds. The data used in the study were obtained from a sample of dairies from the Galicia region (NWSpain). In these herds, the welfare condition had been evaluated according to the Welfare Quality® protocol. Linear regression was used to assess the effect of welfare criteria and principles on the mentioned parameters. The breeding values for milk yield and calving to confidence interval were also included in the models.

Results indicated that the predicted 305-day milk yield increased when the scores for “absence of hunger” and “comfort around resting” increased. The calving to conception interval diminished if the scores for the criteria “absence of pain induced by management procedures”, “expression of social behaviours” and “absence of lesions” increased. Results support that several welfare traits are related to farm efficiency.

Performance and Welfare in one fast-growing and one slower-growing broiler (*Gallus gallus domesticus*) hybrid fed a high or low protein organic diet during a 10-week rearing period

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Organic chicken meat production is characterised by diets based on organic feedstuffs, >10 weeks rearing period, outdoor access, and ban of antibiotic prophylaxis. Until recently, the main hybrids used in organic broiler production in were the same as used in conventional broiler production.

This study compared performance and welfare in the fast-growing hybrid Ross 308 (R) and the slower-growing hybrid Rowan Ranger (RR), that were fed organic diets with high crude protein (CP) (17.0 %) or low CP (14.5%) content during a 10-week rearing period. 429 day-old chicks (218 R and 211 RR) were included in the study and behaviour, weight gain, feed conversion, health and mortality were recorded.

The R birds grew faster (55.4 versus 38.3 g/day, $P = 0.001$) and had a better feed conversion ratio (2.6 versus 2.9 kg feed/kg, $P = 0.001$) than the RR birds. No effect of diet treatments was found on chicken behaviour, but that R broilers were less active and sat, ate and drank more frequently than RR broilers, which stood and perched more frequently. However, both hybrids showed decreasing activity and foraging behaviour with increasing age, while time spent eating and sleeping was approximately similar over the entire rearing period. A higher proportion of R than RR birds were culled because of leg weakness (10.0 versus 3.3 %, $P = 0.03$), indicating poorer welfare among R birds. Thus, strong welfare concerns are raised about using birds of fast-growing hybrids in organic production systems with long rearing periods.

A Clinical Study of dead on arrivals (DOAs) in 4 commercial poultry plants and evidence of risk of suffering entailed therein

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Conflict of interest statement: none declared.

A clinical study of dead on arrival broilers (DOA) was undertaken to identify any evidence of suffering. The study of 96,456 birds was divided into those 90,295 transported at an ambient temperature above 17 degrees centigrade, and 6,161 in cooler conditions. The studies took place at low throughput poultry meat plants in England. The 63,803 birds were from intensive producers, plus 30,592 birds from free range and 2,061 organic birds. The ages varied from 38 days in the intensive broilers to over 80 days of age in the organic birds. All DOAs were opened, examined, photographed and recorded. In heat stressed birds intensively reared birds, 85 DOAs of which 47 showed pale shrunken pectoral muscles, whereas a single consignment of 600 organic heat stressed birds showed 76 DOAs of which 68 had shrunken pale pectorals. A prevalence of 11.3 percent with pale pectoral shrunken muscles in these older birds. The pale shrunken pectorals were readily seen once the cage floor patterned skin was removed giving a two-tone appearance of pale and hyperemic muscles. The cramp-like depressions in the muscles indicated the possibility painful death from acidosis resulting from dehydration. The prevalence of this condition soared in hot humid weather, with transport stoppages, abattoir breakdowns, or poor facilities. The winter weather transport groups were 3,500 intensive birds with no DOAs, 1800 free range, and 861 organic birds also without DOAs. The histology showed pale areas which had failed to absorb haematoxylin or eosin. This may have been due to the build up of lactic acid in these pale pectorals with damaged/leached protein. A video of a bird showed heat stress behaviour.

Practice-driven innovation on commercial farms of laying hens in Spain

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Encouraging farmers to innovate and adopt more animal welfare-friendly husbandry practices remains a critical challenge for animal welfare improvement. Using the egg-laying hen sector as a case study, the EU-funded Hennovation project has been testing ways for practice-driven innovation through innovation networks to improve hen welfare and sustainability.

Two innovation networks were formed providing insight in the dynamics of practice-driven innovation in Spain; one with organic farmers and one industry network with cage system. The industry network decided to focus on increasing the effective control of the Poultry Red Mites (PRM) through regular monitoring on farm. PRM even in moderate numbers, can cause considerable stress, agitation and severe injurious pecking in hens. They introduced simple low cost traps and decided to monitor weekly PRM infestation on 4 commercial farms. Farmers shared their results and elaborated guidelines on the use of those traps as a method for early detection of the infestation; other farmers now use these.

Following a Field-Lab approach the organic network identified mortality in free ranging hens as a problem. They highlighted predation as one of the main cause of death. They decided to tackle this problem proposing the use of alpacas as guardians of free ranging hens. Two young male alpacas shared the range with 450 hens on a farm from the network. Farmers recorded performance data, mortality and attacks from predators before and after the alpacas' arrival.

Preliminary results show that innovation network can deliver practical solutions developed by farmers to improve hen welfare, efficiency and sustainability.

Physiological and behavioural responses of sows to confinement during the peripartal period

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The aim of the experiment was to evaluate the impact of temporary crating on animal welfare, heart rate variability (HRV) and behaviour in 63 sows housed in four different farrowing systems.

For this purpose, three different treatments were applied, which differed in the time point of crating: no crating, crating one day before expected parturition and crating after completion of parturition. Each treatment was applied to one of four batches of 16 sows each. Cardiac activity was assessed during 36 to 12 hours before farrowing as well as 12 hours after farrowing. Concurrently, behaviour was scored from video recordings using 5-min scan sampling. Nest-building behaviour was recorded during the 12 hours preceding farrowing. Linear mixed models were used for statistical analysis.

Irrespective of treatment, the mean heart rate of all sows increased between “period 0” (36h-24h a.p.) and “period 1” (24h-12h a.p.) ($p=0.005$) and RMSSD decreased ($p=0.027$). However, in crated sows LF and the LF/HF ratio increased from period 0 to period 1, while HF decreased, indicating a higher sympathetic activation. Pre-partal fundamental behaviours did not differ between treatments. Non-crated sows showed more nest-building behaviour directed towards straw as opposed to pen equipment than crated sows ($p=0.002$). After farrowing, both behaviour and heart rate variability did not differ between crated and non-crated sows.

Sows which were not crated during the pre-partal period showed higher parasympathetic activity, accompanied by higher time-budgets of nest-building behaviour directed at presumably adequate material. On the contrary, crating after completion of farrowing did not affect the parameters under investigation.

Welfare management and health monitoring of wild boars (*Sus scrofa*) from capture to slaughter: Preliminary results

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The control of wild ungulates in Italy is currently regulated by several norms at national and EU level. However, the definition of animal welfare standards remains a challenge.

The aim of this study was to describe a specific method of wild boars' population control and its possible impact on animal welfare and meat quality.

Two mobile traps were used simultaneously and they were activated one day per week in the period May 2015-December 2016. Harvested wild boars were identified by application of official ear tags in order to ensure their traceability. The animals were transported to the slaughterhouses into wood cages and the entire procedure was timed. Behavioural observations were also performed at different levels: inside the traps and the cages, during the transport and at slaughter. Post-mortem and laboratory analysis were made in order to detect the presence of diseases (brucellosis, leptospirosis, echinococcosis, anaplasmosis, Aujeszky disease, tularaemia, mycobacterium related diseases) and parasitosis. Heavy-metals' levels and pH meat were also tested.

Animals were handled between 15'' and 30'' in the harvesting phase, transport duration was max 90' and they were handled before stunning for about 90''. No stress related behaviours were observed in the trapped boars before the interaction with operators. No case of dark, firm and dry (DFD) and pale, soft and exudative (PSE) meat was ascertained. Stool tests were positive for several intestinal parasites.

In the light of these preliminary results, the proposed process can be considered a possible model for sustainable wild ungulates population control ensuring both animal welfare as well as high quality meat standards.

An insight into husbandry conditions and welfare of pet ferrets (*Mustela putorius furo*)

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Conflict of interest statement: none declared. The study was self-funded.

Although ferrets are popular pets, few data have been published about the different husbandry practices applied by owners (housing, enrichment, feeding, behavioural and social management), and about ferrets' health status. However, these factors are crucial for animal welfare. The aim of our study was to gain insight into various husbandry conditions of pet ferrets, health problems, and the occurrence of behaviours potentially indicative of good or impaired welfare.

Via an online-survey ferret owners were asked about, e.g., number, age, and sex of ferrets; health status; husbandry; ferret behaviours. Data of 573 respondents were analysed. As no answers were mandatory, the sample size varied. Ferrets were aged 3.3 ± 2.3 (mean \pm SD) years old; 56% were male, 44% female (N=529). 34.5% were housed unconfined in the house/flat, 32.7% in a ferret room, 20.2% in indoor, and 12.6% in outdoor enclosures (N=490). Most ferrets were kept in groups of two, three, or four (30%; 27%; 16%; N=500). 4% were single-housed. Cardiac diseases and adrenal tumours were among the most commonly diagnosed diseases. Play behaviour (e.g., with other ferrets, if not solitary) was frequently reported (57.6%: "several times per day"; N=410). Defecation outside the toilet area was one of the more common potential behaviour problems. It was reported "never" (16.7%) to "several times/day" (13.4%) ("once/week or rarer": 38.4%; several times/week: 17.7%; "once/day": 13.7%; N=424). Frequent defecation outside the toilet area might strain the human-animal relationship.

Despite the potential limitations of the study regarding the representativeness of the data (online-survey), it allows a first insight into husbandry conditions and potential welfare issues of pet ferrets.

Impact of changes in law on enforcement of animal welfare standards in the UK

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Conflict of interest statement: none declared.

Since the enactment of the Animal Welfare Act (2006), the courts of England and Wales have had opportunities to apply a more evidence based assessment of animal welfare. This has also been supported by the ability of the enforcement or regulatory teams to utilise improvement notices advising the need to comply within specific time scales and on specified points of concern. Failure to comply with notices could be used as indication of failure to meet the legal minima required. There is a perception that the legislature sometimes fails to understand the offences and their seriousness and the implications that this may have on those on either side of these allegations.

This paper considers 8 cases split between those occurring prior to 2006 under previous legislation and an equal number that have occurred under the later legislation.

Has the legislation made our assessment of animal welfare in the court framework clearer or does the adversarial nature of our court system complicate this step towards providing a scientific derivation and base to the law?

Individual value judgements are still widely accepted and supporting evidence and analytic frameworks are often ignored.

The severity and importance of animal welfare in a social sense appears not always to be understood.

This paper suggests ways in which future legislation could be framed to support a fuller implementation of the mounting evidence base animal welfare science offers in the detection and interpretation of animal suffering and abuse.

Can paw preference be used as a welfare indicator in dog shelters?

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Association between strength of lateralisation with emotional reactivity has been demonstrated in many species (Rogers 2010). This study aimed to investigate whether measuring lateralisation would be a useful tool to assess welfare of shelter dogs.

In the present study, 27 stray dogs were divided into three groups: Group 1 (n=8) consisted of stray dogs in a rehabilitation program at the dog shelter; Group 2 (n=8) involved owned stray dogs and Group 3 (n=11) included stray dogs which had no history of rehabilitation at the dog shelter. A Kong test was conducted for all dogs in order to assess direction and strength of the lateralisation.

There were statistically significant differences in strength of lateralisation between Group 1 and Group 3 as well as between Group 2 and Group 3 (Mann-Whitney U test, $p < 0.05$). No significant differences were found between Group 1 and Group 2 considering strength and direction of lateralisation (Mann-Whitney U test, $p > 0.05$). Most of the dogs in Group 1 (87.5 %) and Group 2 (75 %) showed strong paw preferences, whereas most of the dogs in Group 3 (73.7 %) were found to be weakly lateralised.

Findings of this study supported the hypothesis that non-lateralization of neural functions might be associated with intense emotional reaction (Branson and Rogers 2006).

Consequently, one may suggest that Kong test would be a promising tool to assess welfare of dogs in shelter conditions. Moreover, rehabilitation program for stray dogs seems to be important for lowering stress in shelter environment.

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Attitudes of veterinarians, veterinary assistants and veterinary students to measures promoting cat and dog welfare in practice

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Handling during the veterinary exam and in-practice housing of patients affects an animal's welfare and may guide owner behaviour. Veterinarians play an important role in recognising animal abuse cases. The aim of our study was to investigate attitudes of Austrian veterinarians, veterinary assistants and students to these aspects of the veterinary profession.

We conducted an online-survey asking participants to rate 20 questions about pet-friendly handling, practice environment and handling of abuse cases on a six-point-scale regarding their importance for animal welfare and feasibility during a veterinary visit. Single items were averaged to an importance- and feasibility-scale and veterinarians, assistants and students were compared for single items and scales with Kruskal-Wallis tests.

Measures rated as most important by veterinarians (N=339) included "allow canine in-patients access to outdoors at least three times a day" (mean±S.D.: 5.6±0.7) and "separate cat- and dog-in-patient-housing" (5.4±1.0). Lowest feasibility was assigned to "separate cats from dogs in the waiting room" (3.6±1.5). The groups differed with respect to the importance-scale ($\text{Chi}^2=10.83$, $p=0.004$) and, even more clearly, the feasibility-scale ($\text{Chi}^2=22.87$, $p<0.001$): veterinarians scored higher in feasibility than students (N=255) and assistants (N=52). Only the item "report abuse cases to authorities" was rated as more important ($\text{Chi}^2=19.47$, $p<0.001$) and more feasible ($\text{Chi}^2=15.02$, $p=0.001$) by students.

Working in practice seems to foster positive attitudes to pet-friendly handling and management of the practice environment. Higher agreement of veterinarians to feasibility might be a result of more control over decisions. Fear of losing clients could result in a lower propensity to report abuse cases.

A case study exploring the role of veterinary responsibility in regard to behavioural, welfare and ethical aspects of the UK Dangerous Dogs Legislation

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Conflict of interest statement: none declared

The author was legally instructed to behaviourally assess a 3 year old unneutered male English Bullterrier, rehomed at the age of 1 year, following an incident where the dog escaped from owner control and was alleged to have injured a female. The owner was subsequently charged with allowing a dog to be dangerously out of control in a public place under UK Dangerous Dogs legislation. All witness statements attested to the dog grabbing the female's handbag and using it as a toy, rather than showing any aggression towards her *per se*. Veterinary records at different times indicated a visual defect in the right eye, stumbling, and spinning and pacing when confined in police kennels. Upon assessment, it was immediately noted that the dog was neurologically abnormal, showing excessive need to make physical contact in greetings (including biting at clothing), 'obsessive' pacing at home and circling on exercise, blindness in the right eye, lack of righting reflex and proprioceptive defects in both right side thoracic and pelvic limbs, and no apparent ability to respond to normal communication and training procedures. MRI scanning revealed a left-sided hydroencephaly with associated bony abnormalities. The dog was euthanised on humane grounds.

The questions raised by this case are:

- Would a non-veterinary qualified behaviourist have picked up the symptoms?
- Should previous non-behaviourally qualified veterinary surgeons have investigated the symptoms?
- What are the ethical and welfare obligations of veterinary surgeons in general practice to the potentially 'dangerous' behaviour of their patients in the wider society?

Welfare assessment of shelter dogs under different climatic condition: evaluation of the sensitivity of selected animal-based measures

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The welfare of shelter dogs housed in long-term confinement is influenced by different factors, including climatic conditions (temperature and humidity). Changes in food and water intake, behaviour problems and the occurrence of clinical conditions (for example, parasitosis, gastrointestinal disorders), may be reaction outputs related to environmental factors. High environmental temperature may lead to an adaptive decrease in metabolic rate, appetite reduction and the presence of thermoregulatory cooling behaviours such as panting for example. On the other hand, low environmental temperatures may be associated with increasing caloric intake and thermoregulatory behaviours such as shivering and huddling. The aim of the study was to test the sensitivity of some animal-based measures included in a welfare assessment tool (Shelter Quality protocol-SQP) in detecting the sheltered dogs' outputs related to the change of climatic conditions.

The SQP was performed twice (January and August) by the same observer in 5 Italian shelters. The quantitative variables: "number of dogs shivering/huddling", "number of dogs panting" were analysed using the Wilcoxon test. Confidence intervals were calculated using a beta distribution for qualitative variables: "body condition score", "skin condition", "dog cleanliness", "signs of diarrhoea", "coughing", "evidence of pain" and "lameness". "Number of dogs panting" and "signs of diarrhoea" showed a significant difference between the assessments ($p < 0.05$). "Lameness", "coughing" and "cleanliness" showed no statistically significant difference.

Some measures of the SQP were found sensitive in assessing some changes in dog welfare outputs due to different climatic conditions. Further research, including a larger test population could be helpful to explore the sensitivity of these measures more extensively.

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A prospective exploration of farm, farmer and animal characteristics in human-animal relationships: an epidemiological survey

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Human-animal relationships are essential for dairy farming, impacting on work comfort and efficiency, on milk production and above all on cattle welfare. Many studies have demonstrated the multifactoriality of these relationships. We aimed at assessing the relative importance of various factors expected to be associated with poor human-animal relationships.

On 118 dairy farms, we applied the Welfare Quality® standardized avoidance distance test to 4,418 cows at the feeding rack. The sample of farms covered a wide range of situations (location, size, breed, housing and milking systems). We used Poisson regression to analyse the links between the number of cows that accepted being touched, farm characteristics, animals, management and farmers' attitudes (assessed by a questionnaire using psychometric evaluation scales).

The median was 9.10% of the cows touched by the observer (min-max, 0.0-35.0%). The best fitting multivariable Poisson regression model explained 32.7% of the variability between farms ($P < 0.001$). Calving conditions ('Main calving location' and 'Cleaning or adding litter after calving') accounted for 39.4% of variability explained by the model (sum of squares between classes, SSB). The proportion of cows accepting being touched increased by 1.86 and 2.31 respectively on farms where the main calving location was at pasture or in a calving pen ($P < 0.001$), by 1.57 on farms where farmers did not clean or add litter after calving ($P < 0.01$), by 1.67 ($P < 0.05$) when the proportion of lean cows in the herd was above 45%, by 1.37 ($P < 0.01$) when worker/cow ratio was above 0.05, by 1.34 and 1.87 ($P < 0.05$) when farmers considered 'health' or 'human-cow relationships' as most important issues for farm success, by 1.48 ($P < 0.05$) when farmers' had more than 10 years of experience, and was reduced by 0.86 ($P < 0.001$) when farmers showed more negative behavioral attitudes toward cows (e.g. agreed more about aversive contact).

In conclusion, the human-animal relationship was not found to be associated with farm characteristics but varied with farmers' attitudes and management. We confirm that cows' fear of people is linked to negative attitudes displayed by caretakers towards cows, and is reduced in farms where there was more human contact. Our study also suggests further exploring the key role of factors linked to calving conditions, as cows are more likely to be afraid of people when disturbed at calving.

Animal legal status and penalty regime applicable to mistreats on animals in Portugal

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Conflict of interest statement: none declared.

The Portuguese Parliament approved on December 12th, 2016, amendments to the Civil Code, which set the legal status of animals. With these amendments animals cease to be considered as “things” and have the status of “living sentient beings” and are “subject to legal protection by virtue of their nature”. The amendments to the Civil Code have not attributed to animals a legal personality “*tout court*”, but create an intermediate legal framework (between persons and things): the animal figure, being endowed with sensitivity and the subject of legal relations.

This is a breakthrough long claimed and a milestone in the Portuguese legal framework that puts Portugal at the level of other European countries regarding the legal status applicable to animals. In fact, France was one of the first countries to defend the juridical status of animals as “sentient being”¹. Switzerland was the first European country, in 1893 to constitutionally protect animals², and remains one of the countries with the most advanced legislation in the world regarding animal welfare². Since 1988, the Austrian Civil Code excludes animals from being simple objects or owned things (Pereira, 2005), and in 1990 the German Civil Code included similar wording to the Austrian Civil Code (Pereira, 2005).

However, the Portuguese law still excludes cases of abandonment of animals⁴ and mistreatment of stray animals and other animals as distinct from companion species⁵.

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Welfare assessment of working horses in Uruguay: a pilot study

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Conflict of interest statement

Within an international collaboration for a MSc research project, 8 working horses belonging to 7 different Uruguayan owners were evaluated using the Animal Welfare Indicators (AWIN) welfare assessment protocol for horses. The individual assessment included body condition score (BCS), ocular/nasal discharge, skin lesions, swollen joints, hoof conditions, specie-specific behaviour and human-animal relationship tests. Data regarding the management and resources was gathered by direct observation and assessment. Descriptive statistics were applied on collected data.

No cruelty cases and no major welfare problems were encountered. Relevant issues regarded nutrition and social behaviour. Only three horses had an optimal BCS (=3 on a 5-point scale): three animals scored 2 and the remaining two obtained 4. Only two horses could enjoy full social interactions with conspecifics: four had no opportunity for interactions, two had olfactory interactions. Regarding farms, major inadequacies concerning the provision of water were observed. Only two farms provided functioning and clean water points; in five farms the water point was partially dirty and in one it was dirty.

With nearly 400,000 horses and 3 million of people, Uruguay is the second Country regarding horses/per capita. Horses are both used for working in the field, as well as for sport activities and tourism. Since the majority of horses here are not kept in single boxes, the management conditions are quite different from the European ones, where the AWIN protocol was originally developed and tested. This pilot study could represent a starting point for a more in-depth evaluation of horse welfare in Uruguay using the AWIN welfare assessment protocol for horses.

New physiological indicators for welfare assessment: Cromogranin A

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Non-invasive techniques, such as saliva sampling, are being developed to assess stress with minimal intervention. Chromogranin A (CgA) is co-released with adrenaline and noradrenaline. Several studies suggest that salivary CgA (sCgA) is a sensitive measure of sympathoadrenal-medullary activity. The objective of this abstract is to investigate sCgA as a biomarker of the stress induced after grouping in pigs. Seventy Duroc female pigs were housed in groups of 10 from 65 to 182 days old, to evaluate welfare and feed efficiency indicators. Saliva and blood samples were obtained at 66 (first day after creation of groups) and 181 days old (day before slaughter) to analyse sCgA and haemogram. The number of lesions, using an adapted Welfare Quality® protocol, were recorded at 66, 96, 126, 156, 170 and 181 days old. Social behaviours were assessed by direct focal observations lasting 2h at 67, 96, 126, 156, 170 and 180 days old.

Ratio Neutrophil/Lymphocytes (0.67 ± 0.03 vs. 0.53 ± 0.04) and sCgA (1.34 ± 0.11 vs. 0.97 ± 0.12 µg/ml) were significantly higher ($P < 0.05$) at first compared to second sampling. Number of lesions was also significantly higher ($P < 0.05$) at first evaluation compared to the 4 subsequent ones (0.56 vs 0.26, 0.23, 0.16, 0.17 and 0.21, respectively). No significant differences in social behaviours were found, except for a tendency of a higher number of head butts at first observation.

Overall, the integration of the different indicators suggest a more compromised welfare scenario on day 66-67 (just after mixing the pigs due to hierarchy establishment) compared to day 181. Therefore, the results support sCgA as a biomarker to assess stress in pigs.

**Behavioural and physiological reactions of dogs to the veterinary examination:
Owner-dog interactions improve canine well-being**

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Conflict of interest statement: none declared

The veterinary exam generally induces stress in dogs, and the behaviour of the owner towards his dog could contribute to reduce dogs' stress. Thirty-three dogs were individually submitted to a standardised veterinary examination in the presence of their owners with: a) "contact condition" – the owner petting and talking to the dog during the examination; b) "non-contact condition" – the owner present during the examination but not allowed to interact with the dog. Different behavioural and physiological stress-related parameters were collected for each dog. Using a randomised within-subjects crossover design, we investigated behaviour (n=33), rectal temperature (n=33), heart rate (HR) (n=18), maximal ocular surface temperature (max OST) (n=13) and salivary cortisol concentrations (n=10) in healthy privately owned pet dogs. Results show a significant increase in lip licking, HR and max OST regardless of the experimental conditions, confirming the stressing effect of the veterinary examination for dogs. The testing order had no impact on stress responses. More interesting, the attempts to jump off the examination table ($p = 0.002$) and the increase of HR ($p = 0.018$) and max OST ($p = 0.011$) were less pronounced in dogs tested in the "contact" compared to those tested in the "non-contact" condition. There was no relationship between the duration of the owner-dog interactions and the attenuation of stress. The quality of dog-owner interactions can thus attenuate stress induced by the veterinary examination in dogs. Further studies are needed to define a behavioural strategy to reduce stress in dogs during veterinary examination.

Welfare of working dogs: a preliminary experimental and comparative study in three French administrations

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Conflict of interest statement: none declared.

Working dogs are used in France in the Police Force, Army and Customs for security missions and protection of people. Besides the answer to a growing societal expectation, as well as a legal and moral duty, improving the mental welfare of these dogs is an issue for the effectiveness of the team and the safety of people.

Many factors are involved in welfare determinism such as dog-human relationship, quality of life and living conditions. There are few studies dealing with this topic in foreign administrations. The welfare of some dogs may be compromised.

This preliminary study aimed at assessing the mental welfare of working dogs in the Police Force, Army and Customs, while taking into account differences of the management of the dogs between these three different administrations. It involved 36 dogs in the Army (n = 10), the Police Force (n = 11) and Customs (n = 15). Dog behaviour was observed at the kennel and during exercise. The Dog-human relationship and the quality of life of the dogs were investigated by questionnaire.

In the sample, the mental welfare of dogs did not seem to be optimally respected, as several behavioural indicators of impaired mental welfare (repetitive movement disorders, excessive aggression, signs of lack of socialisation and fears at work, etc.) were found. The behavioural indicators of impaired mental welfare appeared more unfavorable in the Army and the Police. We suggest a hypotheses to explain these results with factors such as kennel life, low predictability of the environment and career, limited opportunities for interspecific and intraspecific social contacts etc.

Future studies could clarify the hypotheses about the welfare of working dogs, identify risk-factors, and define relevant and specific solutions.

Prevalence of depression in Spanish veterinarians

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Several studies have concluded that veterinarians are among the workers that suffer more from psychological distress including higher levels of depression, anxiety, stress and burnout. To date, no studies were done in Spain. Thus, the aim of the present study was to assess the prevalence and risk factors of depression in Spanish veterinarians. Psychological adjustment was measured by the DASS (Depression, Anxiety, Stress Scales) which is a validated scale that was made available online on Google Docs and also divulged in Facebook.

The sample is composed of 932 veterinarians of which 73,6% are females, and with an average age of 33,11 (SD = 7,42). Only 22,7% have children and the majority (86,2%) work full-time. 65.5% work in emergency response services and 35.8% work in shifts. Analyses were performed by use of the t-test for independent samples, ANOVA and Pearson correlations. Results are focused on Depression and show that according to DASS, 40.3% of the sample report Mild to Very Severe values of Depression, while 11.1% display severe/very severe values. Veterinarians with children reported significantly lower rates of depression ($p < .001$) when compared to veterinarians without children. Age, marital status, working in shifts, emergency response tasks and work regime were not a factor ($p > .05$). Spanish veterinarians show high depression prevalence compared to the general Spanish population (8.56%). Even though one cannot compare the results directly since DASS was not used for a clinical diagnosis. Thus it is necessary take measures to improve mental wellbeing in the veterinary profession.

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Case report: Keeping a pot bellied as pet: welfare concerns

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Conflict of interest statement: none declared.

A 14-year-old spayed female Vietnamese Pot bellied pig was brought for clinical evaluation to the Veterinary Teaching Hospital for increased lethargy, poor appetite, and a ventral swelling which was already present for 10 days. The owner administered home remedies including enemas and oral syringing of mineral oil with beer and eggs. Physical examination findings included poor body condition, moderate dehydration, marked abdominal wall swelling in the left flank region and marked claw overgrowth in all four feet. Abdominal ultrasound revealed increased free fluid with fibrin in the abdomen. The owners elected for euthanasia due to poor prognosis. A chronic abdominal wall hernia with intestinal incarceration was found upon post-mortem examination. This may be associated with obstruction of feed passage and explains the animal's clinical signs. The severe claw overgrowth of all feet may have resulted in lameness and is an indicator of poor quality floor in commercial pig farming.

There is an increasing concern of private ownership of exotic animals. Pet pigs include various pot bellied and mini pig species that are considered swine, but are exotic species kept as companion animals. Pet pigs have specific nutritional, behavioural and social needs that might be challenging to provide throughout the animal's life. Inbreeding abnormalities are another growing concern due to selective breeding of these animals based on their phenotype. Policies and regulations regarding private possession of pigs are poor and unclear in most countries. The welfare implications of this case will be presented, in addition to a discussion of case follow-up.

Case report: Multi-focal fractures in a Blue-fronted Amazon parrot (*Amazona aestiva*) - animal welfare implications.

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The cadaver of a 9 year-old blue-fronted Amazon pet parrot was submitted to the Diagnostic Pathology Service for post mortem examination. According to the history, the bird had difficulty standing and a tibiotarsal fracture of its left leg was corrected at a nearby companion animal clinic. To restrict activity and promote healing, the bird was kept in a small dog carrier. The leg was secured to its body and an e-collar was fitted to prevent further self-mutilation. Upon follow-up clinical examination for bandage removal two months later, the referring veterinarian confirmed severe malunion and fracture of the tibiotarsus and the bird was brought for further examination to the Veterinary Teaching Hospital. Radiographs confirmed left midshaft tibiotarsal non-union fracture, but also revealed other significant multiple musculoskeletal abnormalities, including chronic metabolic bone disease. The owners elected euthanasia considering poor prognosis and financial implications. Gross examination of the body confirmed chronic non-union mid-diaphysis of the left tibiotarsus with firm callus. In addition, there was evidence of chronic malunion of the right femur, right radius, and multiple rib fractures with clockwise deviation of the pelvis and sacrum.

Private parrot possession is controversial. Several physical and behavioural abnormalities have been described in pet parrots with inadequate nutrition as well as inappropriate housing and socialization. The welfare implications of this case will be presented, in addition to a discussion of case follow-up.

Absence of stress in sheep whilst witnessing slaughtering process

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The objective of this study was to determine the potential stress response of sheep while witnessing the slaughtering of a con-specific from the same flock and the level of its welfare disturbance.

Eighty female sheep were divided in test and control groups (10 sheep/group), test groups were submitted to witnessing the slaughtering process, while control groups were visually isolated from the slaughtering. Four replicate trials of this experiment in the same conditions were performed in the natural environment of the sheep. PCV, serum cortisol, beta - endorphin from blood samples of two sheep/group were monitored 10 min before slaughtering and 10 min, 1, 3 and 6 hours and 1 day after the slaughtering. The level of mobility was monitored during the experiment using accelerometers attached on the left hind leg of three sheep/group. A multilevel model was tested for each parameter. The clustering and repeated measures were modelled as repeated measure on individual, group and inter-group level. The estimate and SE of cortisol, β endorphin and PCV before slaughtering was 0.555 (0.140), 0.249 (0.112) and 0.503 (0.159) and after the treatment was 28.950 (31.465), 10.341 (27.563) and 1.475 (1.125), respectively. The acceleration values were in the acceleration category 0-1, indicating standing, for both groups without any differences during the procedure ($p > 0.05$).

Results indicate that there was no significant effect of the slaughtering process on the sheep, sheep within group and group within replicate trial for all tested parameters, suggesting no detection of stress and sheep welfare disturbance in tested animals using the described measures and methodology.

Commenting on wildlife trap regulation in Sweden – how veterinarians can impact animal welfare, ethics and legislation

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The Swedish Environmental Protection Agency (SEPA) is currently reviewing its regulation on the use of restraining and killing traps for wildlife. One main objective of the review is to ensure that captured animals are not suffering unnecessarily, which is prohibited under the Swedish Hunting Act. In Sweden, these public review processes are a legal requirement when legislation is written or updated, and aim for transparency. The proposed regulation is communicated to other competent authorities, research bodies and other stakeholders, e.g. NGOs, for comments. In fact, anyone is welcome to comment on the proposal. This open process provides an excellent opportunity for veterinarians with expertise in animal welfare and ethics to voice concerns and provide advice on animal welfare, policies and legislation. Veterinarians can provide scientific data and ethical arguments in situations involving numerous stakeholders, often with discrepant views.

Within the current review, the SEPA proposes clarifications and strengthening of different areas, such as approval of trap use, education of trappers, monitoring of traps and minimisation of accidental captures. However, the proposed regulation does not sufficiently address adverse effects on animal welfare, i.e. stress and physical injuries. Furthermore, suggested changes by other stakeholders may impair animal welfare in the regulation, if adopted uncritically by the SEPA.

The present study will critically review the process of modifying regulations concerning wildlife welfare in Sweden, and the case study will highlight how veterinarians can impact the decision-making process. We provide specific recommendations that may decrease the risk of unnecessary suffering in trap-captured animals.

Case series: Overwork and “letting go” therapy

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Conflict of interest statement: none declared.

The appearance of signs of anxiety in dogs engaged in learning work can be a sign of overwork. This case series explores the efficacy of a new therapeutic method based on “letting go”.

Some authors have described a breakdown in performance at work in explosive detection dogs (1). This phenomenon has also been described in avalanche rescue dogs (2). Overwork is not only a problem for working dogs, as it is also seen in companion dogs (3,4,5). The signs of anxiety vary, and can include: withdrawal, inhibition, obsessive repetitive behavior and psychosomatic disease.

Owner awareness of the problem is not necessarily the only option. The owners of these dogs are often very involved in their dogs’ therapy or education, and it may be more efficient to suggest exercises to relax the dog and reinforce the link.

An original method consists of sprinkling very small pieces of food over a grassy area. The dog is then allowed to sniff out and search for the food without the owner’s intervention, and the dog is self-rewarded by the discovery. The objective is to provide the dog with a stand-alone “mental” physical exercise and to allow it to become fatigued and then relax without being “ordered” to.

In a society where performance and individual success are highly valued, some owners may demonstrate a mirror effect and a significant desire to exhibit a perfect animal, but this should not affect animal welfare.

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Attitude towards animals in veterinary students

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This study was aimed at investigating whether studying for a degree in veterinary medicine affects the attitude towards animals in students.

A sample of 564 questionnaires was collected in three European schools of Veterinary Medicine. The questionnaire included personal details of respondents (e.g. age, gender, year of course) as well as items related to attitude towards non-human animals taken from available literature. Answers were transformed in scores, and items were grouped according to Knight et al. (2004). Scores were analysed by Kruskal-Wallis, Mann-Whitney and Pearson correlation test ($p < 0.05$).

Female students ($N=420$) obtained higher scores than males ($N=144$) in all but the companion animal category ($p < 0.001$). Scores obtained by students did not show a change during the degree course (1st to 5th year of attending) for the vast majority of single items (13/17), as well as for categories of items. However, a significant difference was found for the companion animal category ($p=0.008$). Specifically, female students scored differently in the companion animals category over time ($p=0.004$), whilst male students did not show such difference. The animal rights category showed a positive correlation with academic year in male students ($R= 0.246$; $p=0.006$) and a negative correlation in female students ($R = -0.349$; $p=0.02$).

These findings suggest that attitude towards animals can vary in the students of veterinary medicine over time, especially in women. Future research is needed for a better understanding of the specific factors that affect this attitude during the course, for its possible impact on the way future veterinarians will treat their patients.

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When do horses ask for blankets?

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Horses can adapt to a wide range of climatic conditions. In spite of this, a vast majority of horse owners put blankets on their horses. The aim of the study was to assess horse preference in relation to this practice. We developed a method to teach horses to communicate as to whether they wanted a blanket on or not.

Using operant positive reinforcement (reward-based) conditioning, horses were trained to approach and touch a board with their muzzle. At the same time, association learning between boards with different symbols, one meaning “blanket on” and another “blanket off” was initiated, and the corresponding consequence for blanket status. Later, a third symbol meaning “no change” was introduced.

Within 14 days of 10-15 minute daily training sessions all included horses distinguished between the symbols and were able to communicate blanket preference with humans (Mejdell et al. 2016). We carried on performing tests under different weather conditions. After a 2h stay in the paddock to assure that the horse was fully aware of the weather, the horse was taken to the test arena and given the choice between changing, or not changing, its blanket status. Horses were equipped with (124 tests) or without a blanket (230 tests) in the test situation according to the owner’s routine management.

Sunshine and higher ambient temperatures increased the probability of horses signalling to stay without blanket, whereas rain and wind and very low temperatures increased the probability of horses signalling to have a blanket on.

A study on ante- and post-mortem lesions of Italian heavy pigs receiving different environmental enrichment tools

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Two separate, independent trials (n=40 pigs each, 5 pigs/pen) were carried out to investigate the effects of innovative enrichment devices on some welfare aspects of Italian heavy pigs. In Trial 1, 20 pigs received a hanging metal chain (C1) as environmental enrichment, and 20 received wood logs (WL) placed inside a metal rack installed on one side of the pen. In Trial 2, 20 pigs received a metal chain (C2) whereas the other 20 received a specifically formulated edible block (EB) placed inside the same metal rack described above. Pigs were left undocked and enrichments were always available through the entire growing-finishing period (up to 160kg, when pigs were slaughtered). Skin and tail lesions were periodically assessed on farm according to the Welfare Quality® protocol. The severity of gastric lesions was macroscopically scored on a 0-to-6 scale. Data were submitted to analysis of variance using environmental enrichment as the main effect.

In both trials, skin lesions did not differ between groups, but tail lesions were slightly more severe in WL if compared to C1 group (score 1.24 vs. 1.11, $P < 0,05$). Although all animals were clinically healthy, gastric lesions did not differ in Trial 1 whereas in Trial 2 they were more severe in EB compared to C2 group (score 4.2 vs. 3.2, $P < 0,001$).

Our results show that wood logs have a lower effect against tail biting than metal chains. Besides, further studies on the block formulation and administration will be necessary due to the gastric lesions observed in Trial 2.

How much do you know about Cats?

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Conflict of interest statement: none declared.

Little is known about the domestic animal population and responsible ownership in Brazil (Domingues et al., 2015). We aimed to assess the information level of people adopting cats and cat owners in São Paulo, Brazil.

Eighty-three cat adopters were recruited from three adoption places, and 29 cat owners were recruited from the database of those places. They answered a questionnaire (Salman et al., 1998). A score was calculated by adding a point to the right answer. Higher the score, greater the person's knowledge. The score was evaluated with Wilcoxon Mann-Whitney test ($p < 0.05$).

Respondents got more than half of each answer correct, although some questions had an alarming number of wrong answers. The question "do cats and dogs misbehave to spite their owners" showed that many people still believe that there is nothing the owner can do to improve behavioural problems they might have with the animal (Marston and Bennett, 2003). Seven percent of the participants thought that their animals needed to have a litter before being neutered and 41% didn't know the answer. There is a need to educate these owners to prevent litters to born (New et al., 2000). The score was associated with owners having a cat in the moment they filled the questionnaire ($p = 0.002$); it is possible that the basis for the knowledge was previous experience with pets (Adamelli et al., 2005).

There is a necessity to inform Brazilian owners about responsible pet-ownership. It is a subject that needs to be approached by veterinarians, public authorities and Non-Government Organisations.

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Effects of Tail Docking in sheep on histological features of the muscles of the pelvic diaphragm

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Tail docking in sheep husbandry is often performed due to tradition rather than necessity. This practice causes mild to moderate acute pain and the magnitude of the pain associated with tail removal seems to be related to length of tail removed. Ultra-short docking increases the risk of rectal and vaginal prolapse at lambing relative to sheep with longer tails and predisposes to neuroma and nerve degeneration.

The aim of the present study was to evaluate the histological features of the muscles and the related nerves of the pelvic diaphragm in adult sheep subjected in the past to caudectomy as well as in intact lambs.

After euthanasia, small samples of external anal sphincter, levator ani, coccygeal muscles and branches of deep perineal nerve were obtained, processed according to the usual histological techniques and stained with hematoxylin-eosin and Masson's trichrome.

The results showed changes in shape and size of the muscle fibers of the adult sheep. In fact, enlarged or “moth-eaten” fibers were observed amidst normal sized fibers in each of the three muscles of the pelvic diaphragm; furthermore, some internal nuclei were observed. On the contrary, the lambs’ muscles appeared normal.

Conversely, the nerve fibers were found to be normal both in sheep and lambs.

The muscle abnormalities observed in tail-docked sheep suggest that caudectomy, in the long term, may predispose to prolapses.

Improved understanding of the long-term consequences of tail docking, especially the possibility of chronic pain, is needed.

Predominant animal ethics profile of veterinary students in Lisbon, Portugal

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Conflict of interest statement: none declared

The main purpose of this study was to investigate the ethical profile, with regard to animals, of students at a Portuguese veterinary school and how this profiling may impact on their learning experiences.

To achieve this goal, students from first to last years of Universidade Lusófona de Humanidades e Tecnologias (FMV-ULHT) filled in an individual and anonymous questionnaire. The questionnaire was divided in two parts: the first part included demographic questions in order to characterize the student population. The second part consisted of twelve questions (each allowing five possible choices) taken from the interactive learning tool Animal Ethics Dilemma, available at <http://www.aedilemma.net/>. Each choice represented a specific ethical position (Contractualism, Utilitarianism, Animal Ethics, Relational Perspective and Respect for Nature). The latter part of the questionnaire was translated to Portuguese and validated by experts in animal/veterinary ethics. A total of 670 questionnaires were collected, from which 618 were considered as valid, 431 (70%) were female and 187 (30%) were male.

The predominant ethical profile of Veterinary students at FMV-ULHT was Utilitarianism (60%), followed by Animal Rights (20%), Respect for Nature (6%) and Contractualism (1%). The Relational Perspective was never predominant. In 13% of participants, no predominant profile emerged. Females were significantly more animal rightists than men ($z=-7,113$; $p=,000$), and men were significantly more utilitarianists than women ($z=-7,113$; $p=,000$).

These results are relevant to inform curriculum development and teaching approaches to animal welfare science, ethics and law and should promote a reflection on the aims of veterinary education as a whole.

Ethical perspectives of French pharmacists and veterinarians ethical about the delivery of antibiotics for animals: content analysis of the pharmacy and veterinary literature

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Conflict of interest statement: none declared

Amongst the current most important international debates and priorities in public health is the issue of bacterial resistances to antibiotics, which is due to wide overuse of these drugs. The issue has triggered the setting up of resolutions and policies both in Europe and in the United States. Veterinarians in France and other countries can sell the drugs they prescribe; they therefore have been accused of overprescribing and overselling antibiotics because of a conflict of interest. Pharmacists also sell antibiotics but they may not prescribe them. The aim of this study was to examine and explore the issue of the delivery of veterinary drugs from both the perspective of veterinarians and pharmacists in France.

The pharmacy and veterinary professional literature was retrospectively explored for all articles related to the issue of the delivery of veterinary drugs. Content analysis was then carried out.

The results showed that ethics, improvement of practices and animal welfare were the most frequent themes tackled in veterinary professional literature, whereas journal articles for pharmacists mainly focused on marketing issues. Conflict of interest was frequently mentioned in veterinary literature but was not reported in pharmacy literature. The latter was not confrontational. Pharmacists only reproached veterinarians for abuse of dominant position, that is for not writing prescriptions, thus denying animal owners the right to buy drugs in a pharmacy.

In conclusion, this study provides valuable insight into the professional context of veterinarians and pharmacists with regards to the issue of the delivery of antibiotics.

The use of *Garra rufa* in fish spas: a qualitative study in France

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Conflict of interest statement: none declared

The worldwide development of fish spas is a recent phenomenon and a source of ongoing controversy. It is based on the immersion of human body parts into an aquarium where a small species of Cyprinid fish, *Garra rufa*, is kept. The fish feed on dead skin and thus provide exfoliation. It has been shown to alleviate the symptoms of psoriasis and other dermatologic conditions. However, the use of *Garra rufa* for relaxation, wellness and cosmetology purposes is debated on the grounds of efficacy, sanitation and fish welfare. Some countries prohibited the use of *Garra rufa* in fish spas. The authors carried out a qualitative analysis in France amongst professionals who use *Garra rufa* as well as amongst clients. To their knowledge, such a study was never previously conducted in any other country.

Semi-structured interviews were carried out with owners of fish spas and with their suppliers as well as with clients. Grounded theory was used to collect and analyse the data.

The results highlighted that professionals do not only seek to earn money with fish spas, most of them are highly appreciative of the presence of the fish. They estimated that the lack of regulation was detrimental to their activity. Clients were extremely enthusiastic and satisfied.

In conclusion, it seems that fish spas may deserve more consideration and may even be more widely developed, for human and maybe also for veterinary purposes.

Welfare assessment in spotted hyena: Which behaviours could be used as welfare indicators?

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Spotted hyenas (*Crocuta crocuta*) are gregarious carnivores that live in social groups called “clans”. These groups have a complex matrilineal social structure. Each clan is formed by one to several adult females and their offspring and by one to several adult immigrant males. All females are dominant over all males. In addition, immigrant males have a rank lower than original clan’s males.

Five subjects of spotted hyena were hosted at Parco Natura Viva (Italy) and were organised in two subgroups: the female with the offspring and two adult males, the father and the son of the previous generation. A single group formation in five steps was planned. Our goals were to describe the activity pattern and time budget of each individual, to investigate the influence of sex and social rank on activity patterns and time budgets during the group formation and to investigate which behaviours can be used as indicators of animal welfare.

Nine 15-minute sessions per step per subject were done. Focal animal continuous sampling method was used to collect individual and social behaviours. A single case analysis was run and non-parametric tests were used with a significance level set at $p < 0.05$.

Results show that all individuals performed species-specific behaviours. Moreover, the lowest ranking individual, the father, performed more attentive behaviour, less exploration and less clan social relationship. Focusing on activity pattern and time budget, it seems possible to identify behaviours that could be indicator of a good welfare or a poor welfare depending on duration of performance.

Animal welfare in the fashion industry: a thematic analysis of the policies of mainstream retailers.

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UK retailers publish policies on ethical sourcing of animal products, satisfying public demand for welfare. These retailers have the potential to influence welfare in countries without traditional public regulatory mechanisms due to imposing conditions on imported goods. Farm animal product labelling is common, however little regard has been given to the fashion industry and the welfare of the international animals who supply leather, feathers or fur.

A thematic analysis of policy documents produced by fashion retailers was undertaken to determine their position on animal welfare. All retailers were selected from the store lists of the 10 largest shopping centres in the UK and their policies on animal welfare were requested. Of the 182 retailer websites, 45 published animal welfare policies and, of the remaining, 10 submitted policies by email.

Eight consistent themes were found relating to: fur, wool, leather, angora, feather and down, exotic species, supply chain management and the general treatment of animals. Retailers did not appear consistent in their approach to animal welfare but rather presented a consumer reactionary response. Additionally, limited control was placed on supply chain regulation, unlike that found in food production.

Policies largely focused on the prohibition of certain products and practices rather than promotion of welfare; evidence of good supply chain control was limited. There was a reliance on independent third-party certification scheme, which emerged as key controllers of welfare standards. As major purchasers of animal products, welfare policy should be integral to mainstream fashion retailers' corporate social responsibility to make welfare sustainable.

Review: Development of a novel welfare assessment protocol for use in cattle slaughterhouses

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Conflict of interest statement: none declared.

Measuring animal welfare at the time of slaughter is inherently difficult. Fundamental factors such as effects of transportation, reactions to novel environments and underlying commercial pressures pose significant challenges when establishing a valid, reliable and feasible welfare assessment protocol. However the need for such a protocol is paramount – to allow effective welfare audits, to provide feedback to abattoirs and to enable the effects of welfare improvement measures, such as personnel training, to be quantified.

As part of the preliminary stages of a larger study, a review of the literature regarding welfare assessment at slaughter was carried out. Protocols for welfare assessments for both commercial and experimental purposes were included, and this evaluation, when combined with a number of scoping visits to UK and USA slaughterhouses, was used to develop a protocol for assessing the welfare of cattle at the time of slaughter.

In this presentation the assessment measures included in this protocol are outlined and the feasibility of its use in large commercial slaughterhouses is summarised based on trial welfare assessments carried out in UK slaughterhouses in the summer of 2017.

It is planned that the assessment system developed will subsequently be used to assess and measure lairage and slaughter animal welfare outcomes in a number of slaughter plants in the UK, and USA. The protocol will be applied before, and after, abattoir staff have received specific 'animal welfare' training to assess whether there are measurable effects on welfare outcomes after targeted training.