Valorization

This dissertation contributes to the body of knowledge about the sustainable human-animal relationships in Europe (the Netherlands) and Asia (China and Japan). It analyzed public attitudes toward animals in general and the emotional and environmental relationship between companion animals and owners from cultural and economic perspectives. It aims to improve people’s awareness of animal welfare and reduce the environmental impacts of food consumption by companion animals.

Relevance to the public domain

This dissertation offers an analysis of the relationship between animals and humans and the possible predictor variables involved in this relationship. It is motivated by a strong request for a higher level of animal welfare and a greater concern for animal well-being and environmental protection. Animals, as an important and valuable component of society and the biosphere, are significant for physical survival and critical to the soul. Therefore, studies about animal issues including people’s attitudes toward animals and the possible predictor variables, animals’ emotional world, as well as the environmental impacts of animals are of vital importance. In this context, the dissertation more specifically discusses the issues of people’s understanding of animal emotions and the environmental impacts of companion animals.

This dissertation predicts that the degree of attachment can significantly improve people’s attribution of emotions to animals, which means that improving the human-animal bond is a good way to further understanding animals’ emotional world and then improve animal welfare. These parts (chapter 5 and 6) represent a positive step towards advancing the topic of animal welfare, as a higher attachment to companion animals may lead to a better understanding of animal protection and a higher awareness of animal welfare. These findings suggest that identifying the emotional relationships between companion animals and their caretakers, and eventually promoting the development of an optimal animal welfare measurement system, are the main goals for future studies. Our findings also added to a growing recognition of how individual philosophy relates to public attitudes toward animals in different countries, in particular, Asian countries. Understanding of individual opinions that moral behaviors always lead to good results and activities should be based on universal principles, from cultural and social perspectives, has been predicted to be vital to improving people’s awareness of animal welfare in different countries. Additionally, increasing animal populations and resource consumptions are threatening the natural world. Hence, finding ways to reduce companion animals’ environmental impacts is of critical importance if future food security is to be ensured and long-term sustainability in the environment of achieved. Through chapter 7, 8 and 9, we clarify the specific resource consumption of companion animals in different countries and gain some insights into the strategies to reduce companion animals’ environmental impacts in a national and international level.
Considering that China has a large animal population, while the awareness of animal welfare among Chinese people is relatively lower than that of the Western population. We think it is important to know how Chinese people perceive animals and how to improve their awareness of animal welfare. In this dissertation, we provide some strategies and predictor variables to improve the sustainable human-animal relationships. For instance, try to perceive and attribute animal emotions, communicate with animals by watching, talking and feeding, take care of animals and notify the their important values. We think Chinese people’s (especially Chinese companion animal owners) awareness of animal welfare will improve through the dissemination of the ideas in this dissertation. We additionally think the awareness of animal welfare of all the respondents involved in this research will improve.

This dissertation also provides information to the public (e.g., citizens, government, NGOs), researchers and private individuals (companion animal owners) who are relevant to improve standards of animal welfare and who are willing to contribute to a more sustainable livelihood of animals, especially companion animals.

**Target groups**

The answers to my research questions are relevant for both the academic community and specific groups related to humans, animals and sustainable development. For that, the following groups shall be discussed: science community, animals, companion animal owners, public, pet food industry, government and policymakers.

**Science community**

Some chapters in this dissertation are the first studies to look into human-animal relationships, especially in Asian countries. For example, chapter 2 is the first study to look into the correlation between ethical ideologies and attitudes toward animals in China; chapter 6 is the first study to look into how Japanese companion animal owners attribute emotions to their animals by analyzing the correlations between attachment and emotional attribution; chapter 7, 8 and 9 are the first studies to evaluate companion animals’ environmental impacts by measuring their dietary ecological paw print (EPP), greenhouse gas (GHG) emissions and energy requirement and comparing their resource consumption with human’s resource consumption. Therefore, this dissertation actually provides some basic and new ideas about the relationships between animals and the environmental, as well as the emotional words between animals and humans. Additionally, it also narrows the gap of research into human-animal relationships between Western countries and Eastern countries. Chapter 7, 8 and 9 contribute to the field of empirical research dealing with the relationship between companion animals and environmental issues and therefore can serve as a baseline for further sustainable development studies. These parts are also very important if we wish to make sense of the manner in which other species are related to the environmental world. Additionally, the results about the huge environmental
impacts of food consumption by companion animals may inspire some technology innovation, for example, findings alternatives to meat products.

**Animals**

Animals are the main stakeholders in this dissertation. Animal emotions have been identified as a critical marker for animal welfare, and thus, investigating methods for approaching animal emotions and exploring the correlations between the degree of attachment and the attribution of emotions to animals is essential to understand animal feelings and promote optimal animal welfare worldwide. Very concretely, the dissertation includes five accepted papers in peer reviewed journals. Three additional papers are under review at the time of writing. These papers may attract some researchers’ attention on the fields of animal welfare and human-animal relationships. Therefore, professionals who are expected to advice on such topics should take our findings into account.

Furthermore, this dissertation provides insights into the cultural perspectives that are related to human-animal relationships in different countries. By analyzing the different culture, it helps people to understand why people in different countries show different views about animal welfare and attribute different emotions to animals. This dissertation also provides recommendations for a sustainable human-animal relationship. By asking respondents to answer questions in our questionnaire, we think at least these respondents would show more concern for animals in the future.

Chapters on the emotional relationship between companion animals and owners are helpful for humans to know their animals’ emotions and the reasons behind these emotions. Understanding when, why and how the general public attributes emotional states to animals is very important since the recognition of emotions in animals will be of great help in improving animal welfare. Furthering our understanding of the capacity for emotions and the range of emotions that animals experience is invaluable if environments are to be created in which animals and their emotions are acknowledged and respected, and so optimal animal welfare can be attained.

**Companion animal owners**

Measuring companion animals’ energy requirement and environmental impacts is one of the best ways to improve companion animal owners’ awareness of animal well-being and environmental protection. By quantifying companion animals’ resource consumption and comparing them with humans’ resource consumption, our research successfully demonstrates that companion animals do play a significant role in influencing the sustainable environment and overfeeding and food waste do exist among most of the companion animal households. Therefore, the results used in this dissertation can be valuable to companion animal owners concerned with resource conservation. The chapters on the relationship between the degree of attachment and the attribution of emotions are also relevant to companion animal owners. They provide novel tools to facilitate a high awareness of animal welfare. The attribution of emotions, for example, can contribute to a high attachment to companion animals. By
highlighting the importance of the attribution of emotions to animals, companion animal owners are also inspired to pay more attention to understanding animals’ emotional world. Our results can also promote the cooperation of companion animal owners and veterinarians in order to reduce overfeeding and keep the normal body weight of companion animals.

**Public**

The studies about the correlation between ethical ideologies and public attitudes toward animals can be helpful in providing new perspectives to improve people’s concerns for animals. Our findings suggest that the opinions that one considers that ethical behavior will lead only to positive results and that one prefers to base on universal ethical rules are helpful to improve people’s positive attitudes toward animals. These results provide recommendations toward improving public attitudes toward animals from ethical ideological and cultural perspectives. Additionally, considering that many people from Eastern countries have a lower level of awareness of animal welfare than the Western people. Therefore, this dissertation can serve as a motivational platform on studies of how to increase Eastern people’s awareness of animal welfare.

Findings from this study imply that quantifying companion animals’ dietary EPP and carbon emissions is an important step toward exploring their environmental impacts, which will ultimately improve people’s awareness of sustainability and promote the whole country’s sustainable development.

**Pet food industry**

The chapters on the environmental impacts of food consumption by companion animals can be interesting to pet food industries. They may start to think about how to reduce companion animals’ environmental impacts and simultaneously guarantee their basic energy needs. Pet food industry is the link between companion animals and the environment and between companion animals and their owners. Food plays a critical role in quantifying the environmental impacts of companion animals because animal products have been demonstrated as requiring more land and contributing more environmental impacts than plant-based products to produce equivalent protein energy. These results can be helpful with providing new ideas for pet food industries to redesign animal food, and in chapter 7, we also suggest that the pet food industry should start to confront the issue of the sustainability of feeding pets through advances in product design and manufacturing in order to reduce overfeeding and food waste. The cooperation between pet food industry and technology institution would also deserves more attention in the future in order to supply pet food with good qualities and few percentages of animal products.

**Government and policymakers**

The purposes of performing the dietary EPP and GHG/carbon emissions in the chapters on the environmental impacts of food consumption by companion animals were 1) to
have a clear view of their food consumption, 2) to investigate their ecological impact and 3) to raise their owners’ awareness of environmental protection and animal well-being. These chapters may also be relevant to policymakers and the government because government involvement and regulations are necessary to improve people’s awareness of animal well-being and the environmental protection. Whether policy implication can permanently affect animals’ environmental impacts is an important consideration in policy discussions. By providing the land use, GHG/carbon emission and energy consumption of food consumption by companion animals, this dissertation provides novel approaches to facilitate a more sustainable relationship between companion animals and owners, and the relationship between companion animals and the environment. These findings would play a significant role when policymakers developing companion animal keeping policies. They also provide a scientific basis for the development of the EPP and GHG emission mitigation measures and therefore would make sense for policy initiatives to pay due attention to agriculture production and food consumption. Additionally, since we quantified to what extent companion animals could influence the environment, the government can then include companion animals in the policy system of reducing environmental degradation. Findings in this dissertation can also facilitate governments’ greater investment to encourage technological innovation in not only pet food industry but also agricultural production including finding alternative sources of meat and protein. Yet, we should admit that there is no single evaluation approach can present all dimensions of sustainability. In this dissertation, we also explained that it may be necessary to integrate EPP analysis with other evaluation frameworks so that more scientific sustainable approaches can be addressed for minimizing resource consumption and simultaneously maximizing the sustainability of a country as a whole.