Perception of undergraduate from veterinary medicine course about sustainability in the training of the future veterinarian

João Fernando Zamberlan[1]; Kiara Nicole Jandrey[2]; Maurício Paulo Batistella Pasini[3]; Rafael Pivotto Bortolotto[4]; Ludmila Noskoski Salazar[5]; Aline Alves da Silva[6]; Camila Izabel Giacomolli[7]; Rodrigo Fernando dos Santos Salazar[8],*

Cruz Alta University (UNICRUZ). Municipal Highway Jacob Della Méa, km 5.6 - Parada Benito. ZIP 98.005-972 - Cruz Alta/RS, Brazil

* corresponding author

ABSTRACT

In the last decades, sustainability has become the subject of many discussions mainly driven by the global concern over climate change and scarcity of natural resources. So, some measures were agreed in the major international rounds on the environment as well as on educationally planning of countries that have established a commitment to integrate sustainability in different educational levels. Hence, the objective of this study was to determine the importance given be by the veterinary medicine students about sustainability in their training. The study is descriptive with quantitative approach where the Likert scale questionnaire with 5 scales was used and applied to students of the last semesters of veterinary medicine in a university. Subsequently the data were tabulated and a general boxplot type graph was elaborated showing the distribution of data. Most students presented a high degree of agreement regarding the relationship between sustainability with professional training. It can be drawn the conclusion that it is important and necessary for the formation of the veterinarian of the future.

Keywords: Education; Sustainable Development; Veterinary Medicine.

[1] Full I Professor. Professional Master Program in Rural Development (MPDR). Directory of Postgraduate, Research and Extension (PRPGPE) - Cruz Alta University (UNICRUZ). e-mail: jfzamberlan@unicruz.edu.br
[2] Undergraduate Veterinary Medicine. Veterinary Medicine Department. Center for Health and Agrarian Sciences (CCSA) - Cruz Alta University (UNICRUZ). e-mail: kiarajandrey@hotmail.com
[3] Full I Professor. Professional Master's in Rural Development (MPDR). Directory of Postgraduate, Research and Extension (PRPGPE) - Cruz Alta University (UNICRUZ). e-mail: mpasini@unicruz.edu.br
[4] Full I Professor. Professional Master's in Rural Development (MPDR). Directory of Postgraduate, Research and Extension (PRPGPE) - Cruz Alta University (UNICRUZ). e-mail: rpbortolotto@unicruz.edu.br
[5] Adjunct I Prof. Veterinary Medicine Department. Center for Health and Agrarian Sciences (CCSA) - Cruz Alta University (UNICRUZ). e-mail: lnoskoski@unicruz.edu.br
[6] Adjunct II Prof. Veterinary Medicine Department. Center for Health and Agrarian Sciences (CCSA) - Cruz Alta University (UNICRUZ). e-mail: asilva14@unicruz.edu.br
[7] Undergraduate Veterinary Medicine. Veterinary Medicine Department. Center for Health and Agrarian Sciences (CCSA) - Cruz Alta University (UNICRUZ). e-mail: mila.igiacomolli@gmail.com
[8] Full I Professor. Academic Master Program In Comprehensive Health Care (PPGAIS). Directory of Postgraduate, Research and Extension (PRPGPE) - Cruz Alta University (UNICRUZ). e-mail: rsalazar@unicruz.edu.br

1. INTRODUCTION

From the eighteenth century, the depletion of natural resources has intensified due to human activities, where humanity changed from a rural modus vivendi to an urban one. Any human activity should be based on concepts related to sustainability. The three pillars that guide sustainability, the social, the economic and the environmental, are present in any profession or activity being carried out. However, the term seems to have lost some meaning over time because everything and everyone now call themselves sustainable. This rescue of the real meaning and the perception of the relevance that this theme has mainly, regarded to the professional activities, are fundamental for the technical and human formation in consonance with the environmental preservation and the citizenship.

At the United Nations-sponsored meeting called Rio +20 in 2012, signatory nations agreed that the sustainability theme should be an integral part of curriculum grid and teaching of the courses at all levels. Law 9.795 of 1999, which in its Article 2 says that " environmental education is an essential and permanent component of the national education and it must be present, in an articulated way, at all levels and modalities of the educational process, in a formal and not formal character" (Brasil, 1999). As well as the Ministry of Education, through the Opinion of CNE/CES n. 105/2002, guided on the Curricular Guidelines for the Course of Veterinary Medicine that value the socio-environmental interactions (Brasil, 2002). This insertion can take place by means of transversality in the different contents and disciplines of the courses contributing to the internalization of the concept in the future professional.

Sustainability has been the subject of numerous discussions in the last decades given the depletion of natural resources. The term sustainability was used for the first time in the United Nations General Assembly in 1979. According to Elkington (1998), sustainability must be anchored on three dimensions: environmental, economic and social. Currently, environmental themes are emerging in all social, business and academic scope, being the subject of discussions and studies. The educational process after the industrial revolution aimed at forming skilled labor for the market and this has been the current educational model. Within a policy of expansion of technical and higher education, where professionals are graduated for the labor market, and who, in many opportunities will be those who will form an opinion in the future, the notion of sustainability is imperative (Zamberlan et al., 2015).

Some courses, especially those related to the agrarian field, have in their formation a much more intimate contact with the environment than the other different areas of knowledge. In relation to agrarian practices, veterinary medicine works in harmony with the environment, using different interactions with the environment and animals. These interactions are interrelated with the intrinsic activities and processes of animals affecting the metabolism, bioclimate, pathologies, well-being, reproduction, and production.

In the case of the Veterinary Medicine, there are in some cases, specific disciplines within the curriculum that deal with the subject of sustainability or even with sustainable development, separately. At the end of the course, the subject seems to be empty, with no relations with the other disciplines of the curricular grid throughout the semesters. This situation contributes to providing that the professional does not acquire the necessary awareness about the importance of sustainability within his or her own profession.

One of the relevant factors in the veterinarian profession is its direct relationship with public health and welfare, regarding health surveillance, since it includes the control of vectors, hosts, venomous animals, contaminations, food inspection, where the factors may be biological and not, and all that is related to the three dimensions of sustainability (Franco Netto and Carneiro, 2003). It is important to prepare the prospective veterinarian with this sustainable awareness, a professional integrated to the environment and able to deal with the current complexity of the world, whose profession is integrated with. The function of the universities plays a key role in this training. Therefore, the purpose of this study was to verify the importance given by veterinary medicine students to the sustainability in their training.

2. THEORETICAL REFERENCE

Since the man first appeared on Earth, the natural resources started being excessively exploited. Resources such as soil, water and animals have always been available over the centuries, without the slightest concern with maintaining the quantitative and qualitative conditions or even their resilience. To recognize the benefit that an alternative model to that of dominant neoclassical economic development could enable the world to discuss its possibilities, being essential to rethink how to establish more harmonious relations with the other subsystems of activities (Closs and Antonello, 2014).

That is, the human being would need to know the peculiarities of the planet to use it for a long time, ensuring the continuity of the species itself (Schweigert, 2007). Sustainable development will be achieved if three criteria are simultaneously obeyed: social equity, environmental preservation and economic efficiency (Sachs, 1993).

Barbieri (2007) states that the problems caused by humans arise from the use of the environment to obtain the resources needed to produce goods and services and the dumping of unused materials and energy into the environment. However, this has not always generated environmental degradation, because of the reduced scale of production and consumption and the way in which human beings understood and interacted with nature.

Sustainability can be regarded as a concept imported from ecology, but whose operationality still needs to be proven in human societies (Rosa, 2007). However, if on the one hand, the understanding of sustainability is necessary to promote changes, on the other, the Institutions of Higher Education face difficulties to absorb this understanding and practicing it (Shirberg, 2002).

Educational institutions, especially those of higher education, are the main responsible for the spread of knowledge in the society. They train most professionals who take positions of decision (Trigo et al., 2014). Calder and Clugston (2003) define a sustainable university as the one that helps students understand the degradation of the environment, which motivates them to seek environmentally sustainable practices and sensitizes them to current injustices.

To learn to think for oneself, releasing oneself from conditioned assumptions about the world, about the others and about oneself, is crucial for the labor market, for citizenship, and for moral decision-making in a rapidly changing society (Closs and Antonello, 2014).

A healthy environment contributes to public health and the veterinarian graduated in our universities must be integrated into this process. The Veterinary professional acts in zoonoses, contamination of products of animal origin, animal production and all that has consequences on health and food safety and this has a narrow relationship with sustainability, as they avoid damages to natural capital in the long term instead of short-term benefits that include health aspects (Frazzoli and Mantovani, 2010).

For this purpose, professional training must contemplate sustainability in its educational processes so that the professional of the future is prepared to deal with the intrinsic complexity of the present time. In the last decades, we have witnessed the advent of the discourse of sustainability as the dominant expression in the debate involving environmental and social development issues (Lima, 2003). To teach sustainability, schools need to be more sustainable, as this is the perfect place to learn, to take the initial steps by changing some attitudes (Figueiredo, 2010). It is necessary to find some interaction mechanisms in human societies occurring in a harmonious relationship with nature. “In a sustainable society, progress is measured by the quality of life (health, longevity, psychological maturity, education, clean environment, sense of community and creative leisure) rather than just material consumption” (Ferreira, 2005).

To modify the school, it will be imperative to modify, above all, the training of its teachers (Camargo and Wolf, 2008). In this sense, Moraes (1998) points out that we must work from an early stage with terms such as sustainability, to form citizens aware of environmental values and to practice sustainability. There is a diversity of intentions and strategies that teachers use to expose the phenomenon of sustainability. Some teachers consider sustainability and teaching as themes of difficult relationship and because of that do not allow the theme to be part of their teaching (Sherphard and Furnari, 2013). The training of teachers in a liquid world, as Zigmunt Bauman tells us, which is in a constant change needs to prepare students for a global society that requires that different aspects, such as sustainability, are attended. Schools are filled with students with a diversity of cultures and values that need to be prepared for global society (Freire, 2007).

According to Camargo and Wolf (2008), the solution is not to make sustainability a compulsory discipline in the curricula, but in school environmental education we must emphasize the study of the environment where we live, where we are integrated and from that, to raise the main problems of the community, the contributions of science, the knowledge needed and the concrete possibilities for solving them. Sustainability is bound to a number of meanings, the most common one regards the quality of what is “protected”, “preserved”, “prevents the decay," and "encourages." Since, more important than support preservation, is the need of mobilizing new attitudes of parents, students, teachers, and community, among others, in order to avoid environmental exhaustion. This working from the perspective of curriculum content as well as from the management of physical resources and business in the school daily routine (Figueiredo, 2010).

3. METHODOLOGICAL PROCEDURES

This section describes the procedures needed to be performed for the execution of the research. It starts with the characterization and delineation of the study, the description of the population, the

instruments used for data collection and the way in which the collection was done, finishing with the methods of data analysis

3.1 Study characterization and design

This study was carried out at the University of Cruz Alta, in the Middle Plateau region of Rio Grande do Sul, specifically in the Veterinary Medicine course. The campus of the Universidade de Cruz Alta is in the geographical coordinates 28º 36' S latitude and 53º 40' W longitude at 409 m above sea level. The climate of the region according to the classification of Köpen is the Subtropical Cfa with average air temperature of 18.7ºC, average minimum of 9.2ºC in July and maximum average of 30.8ºC in January. The average annual precipitation is 1,721 mm, well distributed throughout the year.

This study used a quantitative approach, classified as descriptive which, according to Vergara (2011), aims at describing the phenomenon as it happens with no attempt to establish a cause and effect relation, a fact corroborated by Gil (2010) who states that the descriptive research aims to describe in a general way a phenomenon or characteristics of a certain population. As for the means, the research can be classified as a case study because according to Gil (2010), the case study refers to a study of a given reality. An analysis of the curricular curriculum of the course was carried out to verify the existence of subjects related to sustainability or even specific subjects and a confrontation with the PDI and PPC of the course was performed, characterizing a documentary research.

3.2 Population and sample

Veterinarian students of *Universidade de Cruz Alta* (Cruz Alta University) interviewed for this study were those who attended the last semesters of the course or who had completed at least 75% of the credits, making a total of 91 students, of which 34 were from the seventh (7^{th}), 25 from the eighth (8^{th}) and 32 of the ninth (9^{th}) semester. Because the students in the tenth (10^{th}) semester were at the final stage of the course, no questionnaires were applied to them, since they were studying at the most diverse locals, even outside the state of Rio Grande do Sul, making it difficult to carry out the research. The number of the students who answered the questionary were 69, 16 and 21 from the 7^{th}, 8^{th} 9^{th} semester respectively.

3.3 Data collection

As a research tool, questionnaires structured with ten statements with Likert scale were used using 5 scales ranging from 1 totally disagree to 5 strongly agree. A scientific initiation student was responsible for collecting data and going to the classes to apply the questionnaires. To validate the tool, a pre-test was performed with 10% of the students to verify the time spent in the answers and their understanding of the tool.

Once the tool was validated, the questionnaires were applied in the classes of the 7^{th}, 8^{th} and 9^{th} semester of the veterinary medicine course, where the teacher of the discipline was asked to allow the application of the research in his or her class, which was promptly attended in all situations thanks to the understanding of the teachers of the course.

3.4 Data analysis

As data were available, they were tabulated in the Excell software and later statistical analyzes of the frequency of the answers were done and plotted on the Boxplot graph where the distribution of the data showing the upper, minimum and median values of the responses were evaluated. This distribution of the data in the boxplot provides evidence about dimension, asymmetry, and extreme or atypical values (outliers or discrepant values).

4. RESULTS AND DISCUSSION

In this section, it will be discussed the results found in the study in general, analyzing the final three semesters of the course where the students already had completed at least 75% of the course subjects. In the Figure 1 shows the quartile distributions of the general data corresponding to the 7th, 8th and 9th semesters of the Veterinary Medicine course.

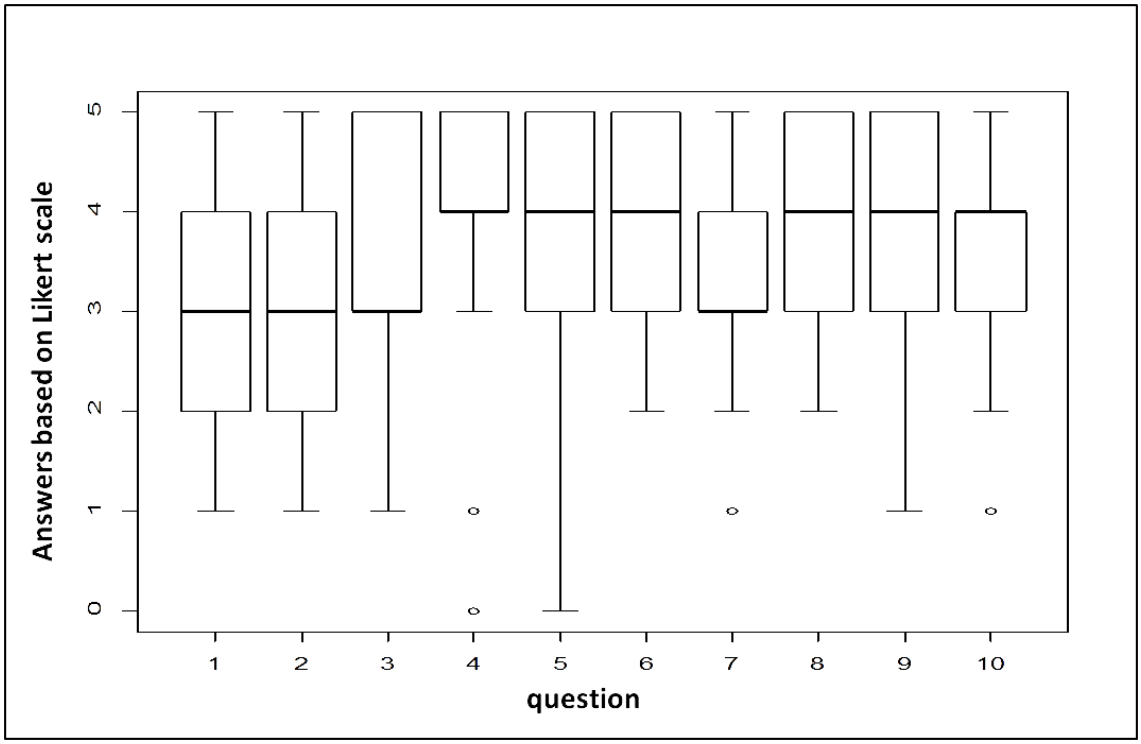

Figure 1. Distributions of the answers regarded to the importance of sustainability in the training of the veterinary medical doctor.

In the case regarding statements 1 and 2, which ensures the existence of specific discipline in the curriculum and that the subject would be approached transversally in the course, the graph shows a certain symmetry between the answers, divided by the value of the median where it is in the center of the answers. There were no outliers or discrepant data, with the occurrence of answers that comprised the maximum value as well as the minimum value. This shows that there is a certain lack of knowledge about the curricular constitution of the course itself and little inclusion of the subject in other disciplines of the course.

Sustainability does not necessarily have to be present formally in the curriculum, what is more important is that it is approached, related and integrated to the other disciplines of the course (Zamberlan et al., 2015).

Statement 3 is about the need for the existence of a discipline when the theme is treated transversally in the other subjects and themes of the course. Most of the answers were concentrated in the third quartile, showing that the answers are above the median value, with some answers that reached the minimum value. This shows that in the perception of the academics, there would be no need to have a specific discipline if the theme was treated transversally in the other curricular contents and that sustainability would be better understood when contextualized. An argument that reinforces the presence of sustainability in the training of the veterinarian is stated by Pfuetzenreiter et al. (2004) that the veterinarian's extensive training qualifies them to perform generalist functions since their training is multidisciplinary in nature, the directions, the human beings and the animals.

The objective of the following statements is to verify the degree of importance and applicability of sustainability in the veterinarian profession. The affirmative 4 sought to verify if sustainability is a fundamental factor in the anthropic actions and if so, it is a consequence in veterinary medicine. The graph shows a great asymmetry, where most answers totally agree that sustainability plays a preponderant role in human actions, located in the third quartile, in the upper part above the median with a high degree of agreement. However, in this case, there were discrepant data or outliers where they stated that sustainability is not fundamental. This often reflects the lack of knowledge of what sustainability really is and its lack of contextualization together with the chosen future profession because it is difficult to visualize where social, environmental and economic aspects are interrelated.

Statements 5, 6, 7 and 8 are related to the practice and the intimate relationship between the subject and the profession. It tries to identify in the students their ability to relate to professional practices and procedures. In statements 5 and 6, the data are located in the third quartile, that is, they agree that sustainability is related to animal production and also the practices commonly used by veterinary medicine in their day-to-day professional life. In this case, the median that separates the third quartile, with the highest concordance data, from the data of the first quartile, with the lowest concordance, is higher than the others, denoting that the degree of concordance with respect to these statements is much higher. A very low minimum datum was found in statement 5 and another in statement 6, resulting in a large number of answers corroborating with the greater value, that is, the superior value. This means that sustainability is viewed by academics as an important subject and that it has high relation with the profession and its practices, being fundamental for their formation.

The degree of agreement was also high. This fact of being related with the area is supported by the study of Souza et al., (2010). Those authors observed that disciplines such as environmental sanitation and surveillance are already part of at least 22% of the courses in veterinary medicine. Cifuentes (1992) states that in order to carry out activities related to the environmental field, the veterinarian should have general knowledge about environmental sciences, as well as knowledge about environment-illness relationship, agricultural activities and their relationships with the environment and basic technology for protection and sanitation.

Statements 7 and 8 verified the relationship with medicines and residues generated by the professional practice in its range of activities and locations. In statement 7, most of the data were asymmetrically located in the upper quartile above the central median, with an outlier or discrepant data that completely moved away from the mean of the answers. Most of the data in this case partly agree, and perhaps the students see that responsibility for the drugs used is intrinsic to the manufacturers and that their co-responsibility lies in simply properly disposing waste and packaging,

This evidence corroborates with statement 8, which is in fact related to residue management. In this case, the median is at a higher position and the data are distributed in quartiles with higher values, that is, it agrees that management in a rational way contributes to sustainability and eventually it has a relevance in the profession. It can be found in this question a high degree of concordance of most answers. No discrepant data were found in this case and one answer achieved a minimum value.

In relation to statements 9 and 10, they are more objective and consider identifying the perception of the students regarding the concepts of sustainability and its integration to the professional training and whether these are easily applicable to the veterinarian profession. Regarding statement 9, most answers were found in the upper quartile with median also high in relation to the degree of agreement. Only one minimal value was found and 50% of the answers were in the higher value range, indicating that the concepts are indeed fundamental in the training of the veterinarian and the professional needs to be prepared to apply them in his or her day to day professional life.

Regarding question 10, it seeks to verify the applicability of concepts and fundamentals of sustainability in veterinary practice. In this case, the answers are asymmetrically distributed and located basically in the central position, and there are also those who attributed superior and inferior values in the answers, with the occurrence of an outlier or discrepant data. This gives an indication that the transmitted concepts are disconnected from the practice, decontextualized. This observation shows the importance of working towards sustainability in a transversal way in the other disciplines. Somewhat that may be attributed to training a teacher who does not feel confident in working with this subject, and the difficulty of identifying a link between sustainability and content, not just by having a specific discipline, which was observed in the statements 1, 2 and 3. This fact is supported by Zamberlan et al., (2015) who, when studying Business Technical course found that when the teacher does not have the knowledge and the perception about sustainability, this is not a guideline for the classes and contents.

However, the dispersion of the data of the analysis was concentrated in the upper quartiles, that is, in higher degrees of agreement, denoting that students do indeed recognize that sustainability is relevant in their formation, but that there is still a lack of information and it should be treated in an integrated and transversal way in the course subjects.

5. CONCLUSION

By rescuing the objective of the study, which was to verify the importance given by the students of the veterinary medicine course to sustainability in their formation, a series of interesting aspects such as the clarity with which the students exposed that the sustainability should be part and must be worked on in

the course. That there is specific discipline in the first semesters (Ecology and Sustainable Development) and that the theme should be integrated with the other subjects of the course. The precepts and dimensions that are the foundation of sustainability are fundamental for their training and the professional practices of the future veterinarian.

They see in sustainability an intimate relationship with the profession, with animal production and that it is related and integrated with several intrinsic activities of veterinary medicine, and they are aware that the environmental management of waste, clinical and surgical materials supplies are necessary. However, they do not feel co-responsible, for example, when manufacturing a drug or a veterinary product, attributing it to the company from the beginning of the supply chain.

Nevertheless, they do recognize that sustainability is important for their professional training and that the market requires veterinarians prepared to act and work in a new reality, where sustainable development is the tool to maintain the integrity of the planet for future generations. However, while this relevance was perceived, the students find it difficult to visualize and operationalize sustainability in their veterinary practice. This may denote that training is disconnected from the current context and that the theme is not handled transversally in the other disciplines of the course.

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