

## Needs Assessment for the Animal Welfare Curriculum for the Bachelor of Veterinary Science (BVSc) Degree in Zimbabwe

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**Abstract.** Animal welfare is a day one competency requirement for veterinarians the world over. In Zimbabwe, as well as in other countries globally, animal welfare was taught to students in the Bachelor of Veterinary Science (BVSc) degree but was never assessed as a standalone course. A need assessment was conducted to determine the need for standalone animal welfare curriculum for Bachelor of Veterinary Science degree in Zimbabwe. An interviewer administered questionnaire which captured both qualitative and quantitative responses was used for data collection. All the respondents suggested that there was need for a standalone animal welfare curriculum for the BVSc course. Most popular reason cited by participants (100%) for the need of the animal welfare course was that there was no stand-alone animal welfare curriculum available. Components of the course suggested include: Animal welfare Science, ethics and law. Animal welfare is a relevant course to the BVSc programme in Zimbabwe whose contents should include animal welfare science, ethics, and law and animal behaviour.

**Keywords:** animal welfare, Zimbabwe, needs assessment, curriculum, Bachelor of Veterinary Science

### Introduction

Animals contribute to the wellbeing of humans in various ways such as food, entertainment, companionship, biomedical research and education etc. Even with these various uses, the welfare of the animals may be neglected. In recent years, animal welfare has become recognized as a critical concern for the long-term viability of animal production systems (Sasidhar and Jayasimha, 2015). Globally, including African countries, animal welfare has become of immense concern (FVE & EAEVE, 2013; AU-IBAR, 2017)). It is hoped that the trend will continue, since the World Organisation for Animal Health (OIE) has included animal welfare among the competencies that all veterinary science graduates should have (Gallo et al., 2016). Veterinarians must be the leaders in advocating for the welfare of animals (OIE, 2012) and must be well versed with animal welfare issues. Even though there has been significant progress in incorporating animal welfare into veterinary training in various schools, there is still more work to be done in terms of their inclusion as standalone courses in undergraduate programmes (Mota-rojas et al., 2018).

In recent years animal welfare has acquired importance worldwide (Molento, 2005). The evolution of animal welfare has been remarkable in the last three decades, culminating into the development of important conceptual and regulatory frameworks. (Sasidhar & Jayasimha, 2015) The study of animal welfare has become an important part of the scientific foundation on which important political decisions are made (Broom, 2011). Because of its multidisciplinary nature, animal welfare, is transforming quickly with the following key areas: law, welfare science and ethics (Main, 2010). Veterinarians are at the forefront of animal care, and have the responsibility and power to promote and protect the welfare and health of animals on daily basis (FVE & EAEVE, 2013). There is a generally recognized requirement to guarantee that freshly graduated veterinarians' animal welfare expertise meets current society's growing interest and concerns in animal welfare and ethics (Lord et al., 2005). As a result, animal welfare is now taught as a core discipline in veterinary science in many universities throughout the world, enhancing veterinary professionals' knowledge and skills (Sasidhar & Jayasimha, 2015). Given this back ground, the authors found it important to determine needs of the curriculum basing on qualified practitioners and on the students with regard to what the curriculum should consist of and the methods of evaluation that are needed.

In Zimbabwe the Bachelor of Veterinary Science Degree programme spans for five years and in this period, learners acquire skills in animal science, veterinary medicine and surgery. Previously, the animal welfare and ethology course was taught to BVSc students as an extra curriculum which was never examined being embedded in the various courses of the curriculum in similarity to other universities (Sasidhar & Jayasimha, 2015). However, animal welfare should be an integral core course that is assessed and examinable in the same criteria as other courses offered for the BVSc programme, There is a wide agreement on the contents that must be included such as ethics and animal welfare science, behaviour of animals and their needs, legislation, ways in which animals are used and ways of undertaking animal welfare assessments (Broom, 2005). Furthermore, according to Mota-rojas et al (2018), courses in animal welfare mainly address animal behaviour, animal welfare science and legislation. Despite this broad consensus, each nation, however, integrates these various concepts in line with its own social, religious, political structures (Tadich et al., 2010). According to a study done in 2010 in Latin America, only 34% of the schools of Veterinary Medicine included animal welfare topics in their curricula (Tadich et al., 2010). Nonetheless, the veterinary profession is multifaceted, with veterinarians' roles being heavily influenced by the importance placed on the animals, financial resources as well as the needs and expectations of the society across regional and country borders (Sabin & Dehaven, 2012).

The curriculum for the training programmes for veterinarians must take into consideration animal welfare and change regularly in response to legal, economic, social and educational demands (Mota-rojas et al., 2018). Training of veterinary students in animal welfare is crucial for a number of reasons. Veterinarians are responsible for educating and training the community in animal welfare. There is also mounting pressure for the vet to know animal welfare as the communities and organisations are becoming more and more aware and concerned about animal welfare (Sasidhar & Jayasimha, 2015). Veterinarians are being employed in animal welfare organisations as implementers and monitors of animal welfare. Furthermore, veterinarians may be called in to give expert advice on animal welfare. These various reasons emphasize the need for the inclusion of the animal welfare course in the BVSc programme. This means that there is need for a consultative assessment of the requirements of the course. Thus, this paper presents the results of the needs assessment for the animal welfare course for the Bachelor of Veterinary Science Degree in Zimbabwe.

According to the Animal Welfare Strategy for Africa's vision, for a sustainable and competitive animal resource business, Africa must be a leader in the application of excellent animal welfare principles, where animals are considered as sentient beings (AU-IBAR, 2017). In an ever-changing culture, veterinarians are, and must continue to strive to be, the primary champions for animal care. Veterinarians are the most significant stakeholders in animal welfare concerns, and it is critical that they develop their advocacy skills (Sasidhar & Jayasimha, 2015). In Zimbabwe the animal welfare legislation is mainly enshrined in the Prevention to Cruelty to Animals act which shows that Zimbabwe as a nation has a high regard for animal welfare. In line with one-welfare approach, concern for the welfare of animals is also a concern for welfare of human beings and involves an inclusive strategy together with sectors related to animals (AU-IBAR, 2017).

Globally, Zimbabwe included, a number of animal welfare organisations have emerged. According to a research carried out in India, animal welfare organisations, although well-intentioned, usually may not be managed in a professional manner, mainly as a result of poor understanding and appreciation of animal welfare (Sasidhar & Jayasimha, 2015). Thus, it is imperative that animal welfare be officially taught in veterinary schools the world over. The key goal of teaching animal welfare is to give animal welfare knowledge to students and equip them with advocacy skills for practical situations (Hewson et al., 2002) and therefore become leaders in animal welfare organisations. For the animal welfare curriculum to be effective, it has to be informed by a needs assessment. The people who take part in a needs assessment usually comprise practitioners/experts in the field and learners/potential learners, who are capable of giving valuable ideas concerning numerous facets of the subject (Sasidhar & Jayasimha, 2015). Using a needs analysis one can also get ideas on the necessary contents, the medium of teaching and styles of learning. This may result in the impact of the changing job markets, society and economy on animal welfare being addressed (Sasidhar & Jayasimha, 2015). There is a dearth of information and variability on the animal welfare curricula in Africa hence the need for a timeous review on existing curricula to suit the needs of individual institutions and the veterinary professional bodies involved. This can be successfully achieved through a needs assessment such as the one carried out by the researchers in this study. This study reveals the need to continuously review the curricula of veterinary schools the world over, in order to ensure that the profession and the programmes are abreast with the changing trends in the field. Whilst adding value to the development of curricula, this study can open up opportunities for evaluating the curriculum elsewhere. Insights on the contents, competencies and methods of evaluation of the animal welfare curriculum, which are ideal for the developing countries like Zimbabwe are revealed. Furthermore, this needs assessment study aids in revealing the growing need for evaluation of the animal welfare curriculum in terms of content, means and methods for evaluation of student performance when administering the animal welfare curriculum. In

the same vein, this study provides the basis for future evaluation of the curriculum for animal welfare in Zimbabwe and elsewhere.

## **Methodology**

### ***Study design***

A survey was undertaken to determine the needs for the Animal Welfare course in the Bachelor of Veterinary Science degree in Zimbabwe. A mixed method approach was used. Both quantitative and qualitative methods were employed. Two groups of respondents were interviewed where one group constituted of participants whilst the other of key informants. Key informants' group was composed of veterinary professionals in the academic field and in practice i.e., lecturers, government veterinarians, private practitioners, and animal welfare aligned non-governmental organisations. The university students undertaking the Bachelor of Veterinary Science Degree in Zimbabwe also participated and constituted the participants group. Participants were interviewed using an interviewer administered questionnaire which comprised closed and open-ended questions whilst key informants were interviewed using an interview guide.

### ***Sampling***

Sixty-five participants were randomly sampled from the students of Bachelor of Veterinary Science Degree in Zimbabwe. The key informants were purposely selected and comprised of 15 veterinary professionals who included lecturers and veterinarians in the field.

### ***Data collection***

The purpose of the research was explained to all respondents. Consent was sought from all respondents and anonymity was ensured as no individual identifiers were collected. Interviewer administered questionnaires were administered to all the participants to ensure that all the questions were responded to and further probing was done for the open-ended questions. The survey sought views on the need for animal welfare curriculum in the BVSc degree programme; the relevance and importance of the course, possible contents and the main animals that the course should focus on, timing and duration of the course as well as the possible methods for assessment. Qualitative research methods were used on the key informants. Key informant interviews were conducted with veterinary practitioners.

### ***Data analysis and presentation***

Data was abstracted from the questionnaires and entered into Epi-info 7. The captured data was analysed using the same software. Frequencies and proportions were calculated and qualitative data was analysed by themes. Graphs and tables were plotted using Excel spread sheet for the quantitative data.

## **Results**

### ***Demographic characteristics***

The study consisted of BVSc students and veterinary professionals as key informants. A total of 80 respondents were involved in the study. Sixty-five veterinary students served as participants and 15 veterinary professionals served as the key informants. Of the 15 key informants five were lecturers teaching various courses in the BVSc degree programme in Zimbabwe, five were engaged in government and four were in private practice and one was engaged with an animal welfare aligned non-governmental organisation.

### ***Need for an Animal Welfare Curriculum***

All participants (100%) suggested that there was need for a standalone animal welfare curriculum in the Bachelor of Veterinary Science Degree. Reasons on the need for a standalone animal welfare course given by the participants are as in Table 1 below.

Table 1  
*Reasons for the Need for an Animal Welfare Course in the BVSc Programme as Given the Participants.*

Aspect	Frequency(n=65)	Percentage (%)
No standalone animal welfare course available	65	100
Day 1 pre-requisite for all veterinarians	50	76.9
To raise competencies in animal welfare	54	83.1
Veterinarians are custodians of animal welfare	100	100
To increase the ethical conducts of vets	46	70.8
To be in line with the global trends	48	73.8
To give AW knowledge to the professionals who deal closely with animals.	65	100

Key informants emphasized the need for a stand-alone animal welfare course that is compulsory and examinable as the other courses in the BVSc programme.

One key informant said,

“All veterinary students should be taught animal welfare because vets are the custodians of animal welfare and globally that’s their role.”

Another had to say,

“There was no standalone curriculum for the Animal welfare course in the BVSc programme so it is imperative that the course be part and parcel of the BVSc curriculum. Furthermore, the animal welfare curriculum is necessary as the animal welfare course is a day one competency requirement and we need not to forget that as vets, globally, we are the custodians of animal welfare.”

### ***Suggested contents***

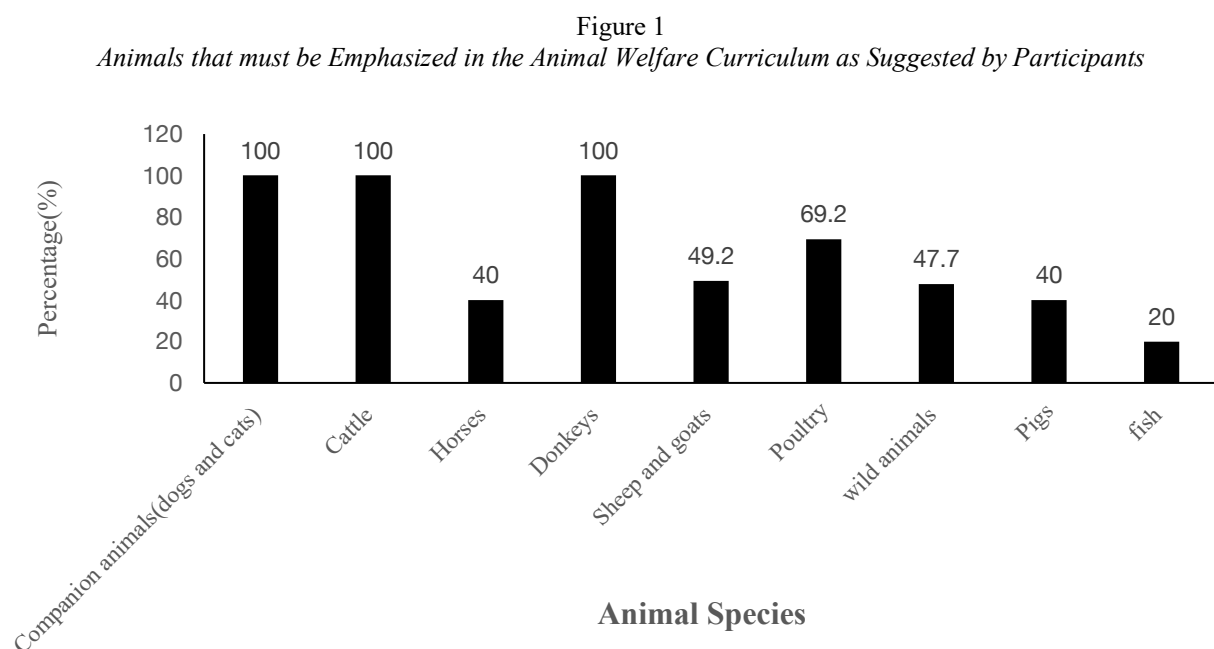
Participants were asked on the contents that should be included into the animal welfare course. Animal welfare ethics was suggested by 56 (85.2%) participants, animal welfare science was suggested by 50 (76.9%) while animal welfare law was suggested by 60 (92.3%). Euthanasia and animal population control was suggested by 64(98.5%), transportation of animals was suggested by 40 (61.5%) while disease prevention and control were suggested by 62 (95.4%). The role of veterinarians in animal welfare and animal handling and pain management were suggested by all the participants while 40(61.5%) suggested that animal slaughter should be included in the curriculum. Animal behaviour was suggested by 50 (76.9%), human- animal interactions and one health by 40(61.5%), use of animals in research, teaching and testing by 57(87.7), animal welfare assessments by 60(92.3%) and while 62(95.4%) suggested welfare of specific categories of animals to be included in the course.

Key informants suggested topics that included all the topics suggested by the participants among others which included disaster management, environmental enrichment and immunology. They suggested that animal welfare science, ethics and law must form the basis of the course. One of the key informants said:

“We need not to forget that animal welfare is a multi-disciplinary and multifaceted issue and as such various aspects must be included such as human-animal interactions, ethics, animal welfare and disasters, pain management, animal handling and the effect of animal husbandry on animal welfare. Also, animal welfare assessments, animal health, antibiotic use and drug resistance, vaccinology and immunology, parasitology, transportation, animal slaughter, environmental enrichment, genetics and animal behaviour, among others must be included. I am just saying that, animal welfare goes beyond the five freedoms, though the five freedoms form the basis of animal welfare. Animal welfare science, ethics and law must be emphasised in the animal welfare course”.

### ***The animal species that must be emphasized***

The main animal species that the participants suggested need to be emphasized are indicated in Figure 1 below. Companion animals, cattle and donkeys were suggested as animals that must be focused in the animal welfare curriculum by all the participants, while poultry were suggested by 69.2 % (45) of the participants.



Key informants suggested the same animal species as the participants but further included the animals used in research, testing and teaching as well as wild animals. The majority of the key informants suggested that emphasis must be placed on the animals under human custody. On the animals to be covered in the course one of the key informants said:

“Main emphasis must be placed on the common animals that the veterinarians are likely to meet during their practice such as the cattle, dogs and cats, pigs as well as the poultry and not forgetting one of our main working animals here-the donkey. Furthermore, these animals can be covered in categories such as companion animals, food animals, animals used in entertainment, laboratory animals and working animals etc. At least this will ensure that most of the animals are covered since it may be impossible to cover all the animals”.

#### ***Duration and timing of the animal welfare course***

On the level of the course the majority of the participants (69.2%) suggested that the animal welfare course should be done in the first year of the BVSc degree programme (Table 2). One of the reasons why the course is supposed to be offered at level 1 was that it would ensure that the student can get more enlightenment as he/she progresses with the programme. The need for reorientation in animal welfare before the student leaves college and gets into practice was cited as a reason for preferring the course in the later years. When the participants were asked about duration, the majority (73.8) of the participants suggested that the course should be done for one semester whilst a few (26.2%) suggested that the course should be done for two semesters. There were no other suggestions beyond two semesters on the issue of duration.

Table 2

*Timing and Duration of the Animal Welfare course as Suggested by Participants*

Aspect	Year/number of semesters	Frequency (n=65)	Percentage (%)
Level of study	1 <sup>st</sup> year	45	69.2
	2 <sup>nd</sup> year	5	7.7
	3 <sup>rd</sup> year	3	4.6
	4 <sup>th</sup> year	9	13.8
	5 <sup>th</sup> year	3	4.6
Duration	1 semester	48	73.8
	2 semesters (1 year)	17	26.2

The majority of the key informants suggested that the course should be taught in the first year and for one semester though they noted that the course should be emphasized in other courses of the programme including the clinical years. On the issue of duration and timing one of the key informants said:

“The veterinary programme is heavily loaded. But the course has to fit somewhere usually in the first year of the veterinary programme so that students can get an orientation to their future profession and that’s when the programme will have a slot. If offered in the first year for one semester that will be great. As students progress in the BVSc programme they will be assimilating and applying and can revisit what they would have learnt. That way the students can consolidate the concepts and apply them. In fact, animal welfare should be emphasised and be integrated in the other courses as the students progress through the BVSc programme”.

### ***Methods of learning and delivery***

The respondents suggested various methods of delivery (Table 3). Lectures and discussions were suggested by all the participants, while field/ farm visits with practical sessions were suggested by 69.2% (45) of the participants. Field attachment and internships were suggested by 61.5% (40) of the participants and presentations and debates were suggested by 58.5% (38) of the participants.

Key informants suggested a myriad of methods of learning and delivery which included those that were suggested by the participants. Other methods suggested by the key informants included the use of videos and group discussions. On method of delivery one key informant said,

“The modes of learning and delivery of the course should ensure that there is variety of modes that are used such as presentations, discussions, case studies, and field visits as well. There should be more of the student learning-by-doing and appreciating the course. In other words, it must be practical, student centered and less of lecturer.”

### ***Methods of assessment***

The respondents suggested various methods of assessment of the course and some of the methods suggested by participants are illustrated in Table 3. In-class tests and final written examinations were suggested by all the participants while field/ farm visit reports by 50(76.9%).

Table 3  
*Methods of Assessment of Students in the Animal Welfare Curriculum as Suggested by Participants*

Method of Assessment	Frequency	Percentage (%)
In-class tests	65	100
Field/ Farm Visit reports	50	76.9
Presentations	40	61.5
Oral examinations	45	69.2
Final written examinations	65	100

The suggestions of the key informants were in agreement with those of the participants. The key informants suggested these other methods of assessment: individual and group assignments, attachment reports and emphasized the need for continuous assessment and final examinations.

On methods of assessment of the key informants said:

“The methods of assessment need to be thorough and rigorous and various modes of assessments must be used and not only one method. Thus, the assessment must have continuous assessment and the final examinations. The continuous assessment must include presentations, field visit reports and in class tests while the final examinations must include short answer questions and long answer questions that are mainly practical based.”

## Discussion

The present survey established the need for the animal welfare curriculum in Zimbabwe and there was a broad agreement between key informants and participants on the contents, the animals to be emphasized, the level and timing of the course, the modes of delivery and the methods of assessment. This was mainly because the animal welfare and ethology course was either taught as a separate course but was never examined. Furthermore, the animal welfare course was taught as a hidden curriculum that was subsumed in other courses of the BVSc programme. The worldwide push for sustainable security in the food sector have necessitated the production of veterinary graduates who play ambassadorial and leadership roles in ethical food production and animal welfare (Johnson et al., 2015). A curriculum has to be relevant to the community and the veterinary accrediting body. Animal welfare curriculum is important for the Veterinary professionals because the veterinarians are the custodians of animal health and animal welfare globally (Coleman, 2010). Also there is mounting pressure even from the non-veterinary professionals and custodians of animals to uphold animal welfare in their practice of the profession (Sasidhar & Jayasimha, 2015). Veterinarians must have a deep appreciation of animal welfare in line with their oath and must uphold it (Molento & Calderón, 2009). According to the Animal Welfare Strategy for Africa, numerous initiatives that are ongoing on animal welfare in Africa and globally including the global OIE strategy on animal welfare are providing prospects for more accomplishments in enhancing the welfare of animals in Africa (AU-IBAR, 2017). Most of the participants acknowledged the need for the animal welfare curriculum as a standalone course. This is because there has been a swelling interest in the society on animal welfare and therefore the veterinary profession has a role and opportunity to provide leadership and expertise on issues pertaining to animal welfare (Colonius & Swoboda, 2010). It is also a common perception of students of veterinary science that they should have formal training on animal welfare (Molento & Calderón, 2009). The participants agreed that the veterinarians were the custodians of animal welfare. This is because veterinarians are considered as a reliable source of expertise and information on the issues pertaining to the welfare of animals in addition to having a professional duty and obligation for the protection of the welfare of animals and directly influencing animal care (Coleman, 2010). Training in Animal Welfare for veterinary students is important for the improvement of animal welfare, especially in developing countries (Huertas et al., 2014). Training in animal welfare for the BVSc programme in Zimbabwe would allow the veterinary professionals to be in line with the global trends and the requirements of the society. Thus it is important that the teaching of veterinary science students through a standalone animal welfare course be adopted to fulfil the professional competence the veterinary professionals are expected of by the society (Mota-rojas et al., 2018). International and public institutions involved in the regulation of the veterinary profession have loft expectations in terms of leading and understanding animal welfare issues (Molento & Calderón, 2009). Fears exist that, unless veterinary students get a formal course in animal welfare as part of their training, they may be considered oblivious of the animal welfare discipline as veterinarians (Johnson et al., 2015). It was suggested that the animal welfare course should be compulsory for the BVSc programme in Zimbabwe. Taylor et al. (2014) found that 98% of the schools in Latin America had optional animal welfare curriculum while a study in Mexico by Alonso-Spilsbury et al. (2016) revealed that that twenty-five percent of veterinary schools in Mexico had adopted animal welfare compulsory instruction. High standards of animal welfare are expected by consumers, governments and producers of animals from veterinary graduates who are expected to give expert advice as they are the experts in the field. The participants agreed that the training in animal welfare will raise the ethical conduct of veterinarians in practice. These findings are in agreement with those of Johnson et al., (2015) who found that formal training in animal welfare aids in improving the standards of veterinarians. Training of veterinary students through a standalone animal welfare course will help to increase their knowledge and skills in animal welfare (Sasidhar and Jayasimha, 2015). The educational process that results in the acquisition of the first professional veterinary degree must give all veterinary science graduates the basic knowledge and skills for the veterinary profession and services as stipulated by the OIE, despite the myriad career paths available to graduate veterinarians. If these fundamental skills and knowledge lack among veterinary graduates, the capacity of VS of the country will be negatively affected (Sabin & Dehaven, 2012).

Various course contents were suggested by participants and key informants. Surveys carried out in Latin America by Taylor et al (2014) and Tadich et al (2010) show that there is a marked diversity in terms of the contents of the animal welfare curriculum among various schools that teach and offer veterinary sciences. Most of the participants and key informants suggested that animal law, ethics and animal welfare science should be part of the curriculum. The findings of this study are in agreement with Sasidhar and Jayasimha (2015) in India who established that animal welfare science, ethics and law should be components of animal welfare course curriculum. There is a myriad of important areas for the teaching of animal welfare (Hewson et al., 2002). However there is a general agreement that the various animal welfare course contents should be included, such as ethics, animal welfare science, ethology, animal welfare laws and animal welfare assessments, as well as how animals are used (Broom, 2005). Skills on how to reason ethically when confronted with ethical dilemmas in practice are required in the veterinary profession (Johnson et al., 2015). Any training and instruction in animal welfare must have: legislation (policy), ethics and animals behavior, as well as welfare of animals during transportation as key cornerstones (Fraser, 2006). According to Mota-rojas et al. (2018) some faculties usually focus more on matters to do with ethology and ethics while some preferentially focus on the welfare of specific groups of animals such as: wildlife, companion animals, production animals or animals in captivity (Mota-rojas et al., 2018).

Respondents suggested the inclusion of animal behaviour or ethology in the animal welfare curriculum. This is in agreement with the findings of other researchers such as (Mota-rojas et al., 2018). An appreciation of ethology or animal behaviour is important because animal welfare is a component of applied ethology. The study of ethology or animal behaviour will help students understand needs of animals and broadly familiarize themselves with animal behaviour (Fraser & Broom, 1997). For one to understand and be able to apply animal welfare he/she has to understand ethology and at the same time, animal behaviour can be used to assess and evaluate animal welfare. The training of veterinarians in ethology will enhance the understanding of animal welfare as well as improvements in the community through enhanced production (Fraser & Broom, 2010).

The respondents also suggested that transportation of animals should be included in the animal welfare curriculum. This especially so because the OIE has guidelines for the transportation of various animals species such as the cattle, pigs and has guidelines for transportation of animals by sea, air and road (World Organization for Animal Health (OIE), 2015). Transportation of animals must be covered as the transportation of animals affect their welfare and the OIE have guidelines on the transportation of animals which can serve as the basis of training and learning of veterinary students and professionals (World Organization for Animal Health (OIE), 2015).

Participants also suggested that the issue of the one health concept should be included. One health affects the welfare of both the animals and man in conjunction with the environment. Thus, under this concept, environmental issues such as natural disasters and climate change, and the issues affecting animals and man such as the antibiotic and antibiotic resistance will be covered. The respondents also indicated the need for training in animal handling. This is in agreement with the research undertaken in Latin America by Hewson et al (2002) where students in animal welfare course were trained in animal handling skills. Students in the animal welfare course familiarise with alternative and standard husbandry systems, gain knowledge on normal and abnormal behavior, animal handling and animal welfare needs (Hewson et al., 2002). Students should get insights into animal welfare ethics, human-animal, detection of diseases and injuries due to poor husbandry systems as well as the various methods of assessing animal welfare and should have knowledge on animal welfare issues associated with slaughter, transportation and animal mutilation issues as further topics (Hewson et al., 2002).

The majority of the participants and key informants suggested that the course should be taught in the first year of the BVSc programme which was in agreement with the recommendations of the key informants. This is necessary because the course at this stage would help most of the students to have interest in animals and their welfare. Furthermore, teaching the course at this level together with other courses such as physiology and anatomy helps the students to assess if really they would be committed to the love and care of animals in their career lives and whether they should continue pursuing the Bachelor of Veterinary Science degree programme or not. This in a way would help reduce future drop outs from the programme. Undergraduate veterinary students without knowledge of animal welfare tend to have challenges in their moral reasoning as they progress from year one to graduation (Quinn et al., 2012). Furthermore, earlier introduction of students to animal welfare will equip the veterinary students with moral reasoning levels that are higher and associated with better practice in the clinical years (Bebeau, 2002) and thus improve the student progress in undertaking the BVSc programme. A study undertaken in Europe established that other veterinary schools were also undertaking the Animal welfare course during the first year of veterinary science education (Hewson et al., 2002). Nonetheless, a carried out in Latin America recommended the inclusion of the animal welfare course after students have learnt cellular biology, physiology, deontology and pathology (Mota-rojas et al., 2018). Animal welfare course is a multi-disciplinary course that entails an understanding of law, ethics, nutrition, husbandry, ethology, physiology among others. Thus, it may make a logical sense that the student be taught animal welfare during the last years of his/ her veterinary degree programme when he/she has understanding of veterinary science. However, there are various benefits that can be accrued if the student is taught animal welfare in the first year of the BVSc programme. Awareness of the animal welfare knowledge in the early stages will determine whether the student loves animals or not. This is plausible, since animal welfare must ensure that the students have passion and compassion for animals and thus will guide them in the training with one major plan of them having love and care for the animals. This will ensure that the students take training in the veterinary degree more seriously. Also the constraints of time (FVE & EAEVE, 2015) in the degree programme only ensures that the course be taught during the first year at college when they have more time as well. Furthermore, the training of animal welfare in the first years of the veterinary science programme will enable the student to apply and consolidate their animal welfare knowledge. Finally, the knowledge of animal welfare can always be complimented and reinforced in other courses of the veterinary science programme.

The majority of the respondents suggested that the course be done in one semester. Results of a study by Alonso-Spilsbury et al (2016) indicate that there is no consensus on how many semesters the animal welfare courses should be taught, a range from one to six was found. The amount of time allocated for the course is of importance. However, as a new standalone course other factors will serve as constraints. These include the presence of the other courses and globally the BVSc programme is loaded (FVE & EAEVE, 2013) as alluded to by the key informants in this study. Thus, the time allocated for the animal welfare course has to be balanced



with the amount of time available. Ideally, the animal welfare course for the BVSc degree programme in Zimbabwe should be undertaken in one semester in the first year when the students have a lighter workload.

This study revealed lack of time and space in the veterinary curriculum as a major barrier in strengthening the teaching of animal welfare. This is in agreement with the findings from other veterinary programmes the world over (FVE & EAEVE, 2013). It is only in the first year of their BVSc degree that students have some free time. Thus, the suggestion by the majority of the participants and key informants that the course should be undertaken in one semester makes some logical sense as this would ensure that the curriculum has somewhere to fit in in the BVSc curriculum. Furthermore introducing the course in the early years of the BVSc study enables the student to understand their future roles and relationships with animals, and the relationship between animals and man and enhance their progression (Quinn et al., 2012).

The majority of the participants suggested that the animals that should mainly be focused on are cats and dogs, cattle, donkeys and poultry. Cattle constitute the largest number of animals that are kept by most of the farmers and constitute the largest type of animal species that are kept in Zimbabwe. Thus, it is imperative that much emphasis be put on these animals during the training of veterinary students. Although the animal welfare course should cover the welfare of animals that mainly interact with human beings, it is very important that more coverage is placed on the welfare of farm animals as a result of their importance in agriculture (Hewson et al., 2002). To be effective in meeting the expectations of the society on the proficiency in assessing issues of animal welfare and giving recommendations for the treatment of animals (Yeates & Main, 2011), graduates of veterinary schools must be able to identify what bad or good animal welfare means for various species of animals (Johnson et al., 2015). All participants agreed that emphasis of the Animal welfare course must also be placed on pets which are the cats and dogs. The reason being that almost every vet will come across them in their training and practice. All the participants agreed that the donkeys must be focused on as well. This is because the donkey is one of the commonest working animals in Zimbabwe especially in the drier parts of the country and may be neglected. The role of working animals in livelihoods and food security is becoming increasingly recognized locally and in some national economies with working camels, mules, horses and donkeys reportedly represent over 19 million heads in Africa (AU-IBAR, 2017). Fewer participants suggested that focus must be placed on fish, wild animals, horses and the small ruminants. This is because these species have mainly been attended to by specialists in Zimbabwe for the small ruminants that have been neglected. However, of late, a number of non-governmental organisations promoting small ruminants and aquaculture in Zimbabwe have managed to stimulate interest in the fish and goat species health and welfare. This shifting mind-set could have resulted in some participants to indicate that fish and goats should be considered and also emphasized in the animal welfare curriculum. The study of animals under six contexts: aquatic animal species ; those animals living in the wild ; animals used in teaching and research, livestock/production animals; animals used for display , sport , recreation, work and companion animals; (Johnson et al., 2015) would help in the inclusion of most species including fish and small ruminants. Elsewhere, such as in Vienna, students in the animal behaviour and handling course mainly focus on horses, cattle, and pigs (Hewson et al., 2002).

The demand for animal welfare training is high in veterinary education and different approaches are needed (Mota-rojas et al., 2018). The participants and respondents indicated a myriad of training methods. The respondents indicated the need for farm visits in animal welfare training. Training in animal welfare should include a farm visit specifically addressing welfare issues (Hewson et al., 2002). In the 21st century, University instruction should endow the processes of learning with a high degree of practicality and a sense of usefulness (Mota-rojas et al., 2018). The participants also indicated that there is need for training in animal handling. In Canada in the animal welfare, course, students take part in restraint labs and livestock handling which emphasize the safety of both people and animals as well as emphasizing on low-stress animal handling (Hewson et al., 2002). This means that the animal welfare course is more practical. In Vienna students in AW course also have to attend for practicals and lectures on animal handling and animal behaviour, which focuses primarily on pigs, cattle and horses (Hewson et al., 2002). The respondents also suggested the use of case studies. Case-based learning improves the retention of knowledge and the application of learned material (Grauer et al., 2008). Scenarios that are well developed are relevant and engage the students and thus allows them to gain skills and knowledge through practical applications in a supported and safe environment (Johnson et al., 2015).

Various methods of assessment were suggested by the participants and key informants that include the final written examinations, oral examinations and fields and attachment reports. These findings are in line with the methods that are undertaken by other universities across the globe (Hewson et al., 2002). Field visit reports also serves as a useful way of assessing the students. However, field visits may be limited by the lack of resources (Hewson et al., 2002). Farm and field visits reports are important in enabling the students to be able to carry out animal welfare assessments (Hewson et al., 2002). There is no general agreement on the areas that animal welfare courses must cover as well as the depth to which the course must be assessed (Mota-rojas et al., 2018). The various methods suggested by the participants can be adopted for the animal welfare course in Zimbabwe. However at the University of Gent, student's proficiency and competency in animal welfare is assessed by the use of a final written examination only (Hewson et al., 2002) due to the huge classes. Thus, a number of aspects determine the methods of assessment that are used and these include

the number of students and resource availability. However, the formative and summative assessment of students that is usually done for the other courses for the BVSc degree programme in Zimbabwe is crucial. The formative assessment includes the continuous assessment that comes in the form of in class tests, field reports among others, and the formative assessment comes in the form of final written and oral examinations.

### Conclusion and Recommendations

This needs assessment for the animal welfare curriculum forms the basis for an effective and tailor-made curriculum for animal welfare in Zimbabwe. The research also underscores the need for an animal welfare curriculum whose contents must include animal welfare science, ethics and law and ethology, and animal handling among others and the mode of teaching should use various methods, such as farm/ field visits, discussions / debates, lectures, cases studies and attachments/ internships. Various methods of assessments should be employed that include in-class tests, presentations, oral examinations and final examinations with both short answer and long answer questions that are more practical based.

This needs assessment forms the basis for an effective and relevant animal welfare curriculum in Zimbabwe that will take into consideration the local requirements and the need to keep in harmony with the changing trends in the field of animal welfare. This study also emphasizes the fact that a one-size-fits-all animal welfare curriculum is not ideal for every veterinary institution hence it is necessary for institutions to model their own curricula based on responses from the professionals and the consumers of the curriculum in their countries. It is hoped that the results of this needs assessment will be used to generate a standalone animal welfare curriculum for the BVSc programme so as to ensure an effective and efficient learning experience for the veterinary student in Zimbabwe. Adoption of the findings of this study specifically for the Zimbabwean veterinary curriculum is recommended.

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