Ethiopian Veterinary Association (EVA)

Assessment of Key Gaps in the Quality of Veterinary Education in Ethiopia

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1. BACKGROUND

1.1. The Establishment, History, and the Current Veterinary Education

Since 1762 when the first modern Veterinary School was established in Lyon, France, hundreds of veterinary education establishments have been founded throughout the world. Up until 2017, 111 countries of the world have 597 Veterinary Education Establishments offering veterinary degrees. Until 1950, only four Veterinary Faculties were established in Africa including those located in South Africa, Sudan, Egypt, and Nigeria (Mayen, 2006). In Ethiopia the first Veterinary Education Establishment was the Institute for Animal Health Assistants, which was estabilished in 1963, where animal health assistants were trained in a two-year diploma program (AAU, 1996). At that time Ethiopian students who wanted to study Veterinary Medicine had to do so in foreign countries, such as the Soviet Union, East Germany, Cuba, France, and the United Kingdom. In 1979 the Faculty of Veterinary Medicine was founded under Addis Ababa University in Bishoftu, about 50km from Addis Ababa. The Veterinary Faculty was situated close to the National Veterinary Institute and the International Livestock Research Institute's experimental station. In addition to these, Bishoftu is in the midst of a large livestock-owning community and commercial farms of beef, poultry, and dairy.
In 1989, the then Faculty of Veterinary Medicine (FVM) and the Institute of Animal Health Assistants were integrated letting the Faculty of Veterinary Medicine run two educational programs: a six-year doctoral degree in veterinary medicine (DVM), and a two year diploma for animal health assistants. As of 2003, more than 20 Veterinary Education Establishments were founded under various universities. Some of them are organized at Department level under different Colleges; 4 are organized at School level but without academic departments and 4 of them are organized at College level with 4-5 academic departments. All of the Veterinary Education Establishments providing DVM degree follow a harmonized curriculum, which is divided into three: pre-clinical, clinical and externship programs.

1.2. The Ethiopian Veterinary Service Needs

Ethiopia has the largest livestock resources in Africa with over 244 million animals having a direct contribution of ETB 150.7 billion per year, which amounts to 49% of agricultural GDP and 25.3% of total national GDP (ICPALD, 2011). It also accounts for 20% of the country's export earnings (World Bank, 2017). The 2021/22 Agricultural sample survey showed that there are 70,291,776 cattle, 42,914,865 sheep, 52,463,535 goats, 56,992,987 poultry, 2,148,492 horses, 10,791.896 donkeys, 382,784 mules and 8,145,790 camels reared under various agro-ecologies. Livestock is Ethiopia's most important income source, and the Ethiopian government prioritized the improvement of the export of livestock and livestock products. A functioning system of veterinary service focusing on prevention and control of diseases and animal health care is of major economic importance, especially in relation to international trade requirements and the current "Lemat Tirufat". The veterinary service is rendered by more than 30, 000, veterinary workforces (7,439 Veterinarians and 23,808 Para-Veterinary professionals). Nearly 90% of the Veterinarians and Para-Veterinary professionals are engaged in the public veterinary service.

The veterinary profession is very demanding and an important profession for development of animal resources, poverty reduction and improvement of rural livelihoods and national economy. The development and growth of many poor countries depend mainly on the performance of their agricultural policies and economics. This relates directly to the coverage and quality of their veterinary services. Quality of national veterinary services depends on a range of factors such as the quality of veterinary education and sound agricultural policies to mention a few. The provision of veterinary services should be based on scientific principles and need to be technically competent, independent and not imposed by political pressure. In Ethiopia, the veterinary service is one of the sectors that have been given attention in the strategic plans like GTP I, II and III, the 10 years agriculture development plan, the animal health strategy and the livestock master plan. The target set was improvement in the veterinary service coverage (accessibility and availability), quality of the service (acceptability and affordability) and establishment of the Veterinary Regulatory Body.

Improved animal health service is thought to significantly increase livestock productivity and consequently boost the financial and social capital and wellbeing of the society. That is, it plays crucial role in achieving food and nutrition security, enhancing household and national income and safeguarding the public health. However, in Ethiopia the coverage and quality of veterinary services are less than satisfactory. To circumvent this Government of Ethiopia has increased the number of Veterinary Educational Establishments although the quality of Veterinary Education in producing competent professionals is questionable as a result of lack of regulatory body. In order to meet the requirements of the rising export standards, the quality of veterinary services need to be enhanced. Quality veterinary services can only be achieved if the Veterinary Educational Establishments are in a position to produce competent graduates. The Ethiopian government has embraced standards set by the World Organization for Animal Health (WOAH), which encompass quality veterinary service and education. However, there is no authority to enact the assessment and monitoring of the essential level of quality of the veterinary education programs.

In every nation, veterinarians and para-veterinarians are responsible for the delivery of National Veterinary Services under the legislative framework and the auspices of the governmental authority to implement animal health to assure the health and wellbeing of animals, people and ecosystems (Craven, 2009). That is, veterinarians and para-veterinarians serve as an integral partner in the "One Health" effort – a collaboration of multiple disciplines working locally, nationally, and globally, to address challenges and attain optimal health for people, animals (domestic and wild) and the environment (WOAH, www.onehealthcommission.org). According to the definition of the WOAH Terrestrial Animal Health Code, the term "Veterinary Services" refers to both the public and private components of the veterinary profession involved in the promotion of animal and public health as well as animal welfare. Every country should have adopted its own standards which the National Veterinary Services meet, but the services should also be able to comply with appropriate international standards and recommendations, such as those of WOAH's Terrestrial Code.

Although the results of assessment of the PVS tools showed improvements, there are still gaps in realizing services of the desired quality and competence. One of the four pillars of the WOAH PVS tool is the human, physical and financial resources pertinent to the veterinary services in which the professional and technical staffing are considered. Based on 2011 PVS evaluation Ethiopia scored 2.6/5. This situation is further exacerbated by the lack of Veterinary Council (Veterinary Statuary Body) to govern and ensure quality of veterinary education and services. As livestock and livestock products remain important export commodities for Ethiopia, quality veterinary services such clinical services, laboratory diagnosis, quarantine, prevention and control of diseases and epideiosurveillance are crucial. In addition, standard and scientific approaches in outbreak investigation and disease reporting are highly demanded. In general the veterinary service of the country is expected to keep pace with international standards in order to get optimum benefit from its livestock resources. Therefore, improving the quality of veterinary services in line with the WOAH standards and the requirements of livestock and livestock products importing countries (compliance with sanitary and phytosanitary standards) is needed.

The improvement of the quality of the veterinary services calls into action the need for assessment and improvement of the quality of veterinary education. During the last three decades, veterinary education has rapidly expanded in Ethiopia, where the number of Veterinary Educational Establishments escalates form 1 in 2003 to more than 20 in 2023.

2. RATIONALE

As such, veterinary education is a cornerstone to assure that the graduating veterinarian has received a level of education and training that ensures sound overall competencies. In addition, veterinary education should ensure the required knowledge, skills, attitudes and aptitudes for understanding and performance of the national veterinary service tasks so as to promote animal and public health. Moreover, basic education that provides the minimum competencies is a basis on which veterinarians and para-veterinarians whether working in the public or private sector can build expertise through on-the-job training and quality postgraduate continuing education.

The veterinarians of the future must be armed with new knowledge, which will be different from that needed today: more knowledge in the emerging disciplines of veterinary science and public health, and consumers require assurance of the quality of food products, from "stable to table" (Zemljic, 2004). Student selection procedures for veterinary teaching institutions must ensure that enough veterinarians are produced to meet those demands. Since we are in the era of globalization, the veterinary profession must try to ensure that an equivalent level of training is provided all over the world. Demands from consumers and the general public for better security of food and feedstuff, public concern about animal welfare, and clients' demands for safer, cheaper, and more effective food production place new obligations and tasks on the whole veterinary profession. Therefore, it is necessary to develop control mechanisms to ensure that the quality of veterinary training and the quality of service provided by the profession are kept to the highest possible standard.

We live in a time when free movement of human resources, capital, and goods is a pillar of economic development throughout the world. Veterinarians should follow these principles with the same level of knowledge and the same level of service everywhere in the world. Because all clients, consumers, and patients have the right to the same level of service and protection, it is of crucial importance that every veterinary student has the possibility to reach the same level of education during his or her studies. To reach this minimum educational standard it is necessary to have set standards and independent control of the educational process and these educational standards must be set by the profession according to the demands and necessities of users.

In many countries there is a close collaboration between veterinary education establishments, National Veterinary Services and National Veterinary Statutory Bodies to ensure the provision of veterinary education that is appropriate to the needs of each country. In countries where veterinarians have to be registered to practice, the process of accrediting veterinary colleges is a valuable tool for registration authorities to assess the competence of graduates (Craven, 2009). Under such situations, the minimum competencies required from graduating veterinarian and para-veterinarian is set in the course of each veterinary school's curriculum. The target is the ability of the graduate to promote global animal and public health and provide an excellent base for advanced training and education for those wishing to pursue a career in both public and private components of

National Veterinary Services. Since the scientific knowledge is expanding and demands on the veterinary profession are increasing, it is essential that graduates be competent in locating, accessing and using appropriate information sources. It is important to note that veterinary education includes not only undergraduate education but also postgraduate continuing education and on-the-job training. It is the national veterinary service authorities and the Statuary Bodies, which ensure and monitor the importance of life-long learning to ensure the various competencies of veterinary graduates such as protecting animal and public health. However, Ethiopia lacks Veterinary Statuary Body to ensure the qualities of the veterinary education provided in various veterinary education establishments and the level competencies of the veterinary professional and para-professionals providing veterinary services in the country. As a result critical evaluation of the quality of the courses offered does not exist, and standards for veterinary theoretical and practical education have not been defined.

It is, therefore, logical to raise the issue of quality in veterinary education in the faces of this rapid expansion in Veterinary Educational Establishments. In order to influence policy makers and other stakeholders to address these bottlenecks, up-to-date evidence is required. However, consolidated information is not available regarding the real depth of the problem, to help strongly justify the potential changes required to mitigate the situation in sustainable manner.

To support these gaps, the Ethiopian Veterinary Association (EVA) through the EU-funded HEARD Project (Health of Ethiopian Animals for Rural Development Project), conducted this study to identify the gaps in veterinary education in Ethiopia.

Concepts and Scope

Veterinary education under the umbrella of higher education, research and innovation play a crucial role in supporting public health, economic growth and global competitiveness. Given the desire for higher standards in veterinary services due to increasing concern for one heath, veterinary education is an essential component of economic and social development. The increasing demand for better skills and competences would shape veterinary education to respond in new ways. This study aims at the identification of factors affecting the quality of veterinary education at veterinary educational institution in Ethiopia. We did not do quality evaluation of the structures, organization, the standards of the curricula, the standards of teaching and standards of the facilities. We used questionnaire to interrogate the three important actors of the veterinary education: the governance (the administration), the students and the academic staff. The focus of the study was the availability and adequacy of infrastructure, standards of teaching and assessment methods, student feedback mechanisms, staff and program development and management, partnering with industries, curriculum design and review and student enrollment.

3. STUDY METHODOLOGY AND APPROACH

The following approaches and tools were applied to achieve the expected outputs:

- Defined and detailed questionnaire for data collection, clear approach, study methods, work plan and method of data analysis.
- Literature review and critical analysis of the current situation of veterinary education establishments in Ethiopia, including major gaps and challenges affecting quality of veterinary education. Analysis also focused on the infrastructure and facilities, academic staff development and governance, the teaching-learning process, weights given to theoretical (lecture sessions) skill development (practical) training, and alignment of the requirements with international standards such that of WOAH, etc.
- Critical analysis of the national veterinary service needs and workforce status (present supply, future demand) done as per international recommendations;

3.1. Consultation of senior professionals and key informant interview

Consultation of senior veterinarians teaching in the Veterinary Educational Establishments was carried out. Nine of the 15 universities having veterinary programmes at the undergraduate level and two technical and vocational education and training colleges were selected. Focal persons were identified from each institution and orientation was given on the purpose of the study and its implementation. Structured questionnaire was developed and administered to the interviews to gather data on important variables. Five instructors mostly teaching clinical courses such as Surgery, Clinical Medicine, Clinical Diagnosis and other clinical courses were selected from each institutions selected for this study (a total of 55). Deans/School heads/Department heads from the selected institution (a total of 11) were also interviewed. In addition, 15 clinical year students were interviewed from each institution (a total of 165). Taken together, a total 231 individual were interviewed to collect the necessary data.

3.2. Physical visits and assessment of VEEs

Visit was made to selected Veterinary Education Establishments and training centers. The selection of the institution for physical visit was based on their geographical location and availability transportation facilities

3.3. Desk review

Relevant data was collected from international and national policy documents, quality framework, international standards (WAOH, FAO, IGAD and others) regarding the quality of veterinary education. Accordingly, published and unpublished reports from national and international sources were used as indicators of gaps in the quality of veterinary education. Review of literatures and documents and best practices of developed countries regarding quality of veterinary education was carried out.

4. RESULTS

4.1. Overall Responses and Profiles of Respondents

Enquiry was made to nine universities during this survey. They include: Addis Ababa University, Hawassa University, Wolaita Sodo University, Jigjiga University, Haramaya University, Semera University, Jimma University, Wallaga University and Ambo University. Three universities namely Bahirdar University, Weldiya University and Wollo University were selected at the beginning of the survey. However, due to internet blackouts these universities were not able to participate in this survey. At the nine universities which took part in the survey, questionnaire was distributed to a total of 45 instructors, 135 senior (4^{th} year and above) students and 9 Deans. Forty-five (100%) of the instructors and 107 (79.3%) of students provided responses. In contrast, only 6 of the 9 (66.7%) Deans responded to the questionnaire. As a result the explanations and recommendations are provided based mainly on the responses of instructors and students.

The profiles of the instructors revealed that 12.2% were professors, 9.7% associate professors, 70.7% assistant professors and 9.7% lecturers. Their qualification include: PhD (12.2%), MSc/MVSc (80.5%), DVM (2.4%), BSc (2.4%) and a PhD fellow (2.4%). They have served the universities in teaching and research for as short as 2 years to over 30 years. The vast majority were having an experience of teaching for 10-20 years. They have a wide range of specialization and often involved in the provision of courses for clinical year students. Their field of specialization comprises: Veterinary Clinical Medicine, Avian Medicine, Veterinary Epidemiology, Veterinary Theriogenology, Veterinary Pathology, Veterinary Parasitology, Veterinary Microbiology, One Health and Tropical Infectious disease, Biostatics and Health Informatics, Veterinary Public Health, Microbiology and Host Pathogen Interaction and Animal Production and Pastoral Development.

4.2. Instructors' Responses

4.2.1. Curriculum Standards

Mismatch between the program course content and market demand was indicated by 22% of the staff interviewed whereas 78% disclosed that the program course design take into the market demand. However, 65.9% of them indicated that the course program design did not take into account the availability of resources. It was indicated that the course design did not take into account human resources (28.6%), financial resources (82.1%) and facilities (92.9%). Only 14.6% of the academic staff indicated exhaustive use of the time allocated for practical sessions while 43.9% revealed the use of time allocated for practical sessions is "somehow" and 41.5% of them did not use the time allocated for practical sessions. The reasons claimed for not using practical time sessions include: lack of supplies such as laboratory reagents and animal models for demonstration (42.9%) and

absence of proper laboratory facilities (32.1%) as depicted in figure 1. The academic weeks scheduled per semester are reported to be in adequate (70.7%) and adequate (29.3%).

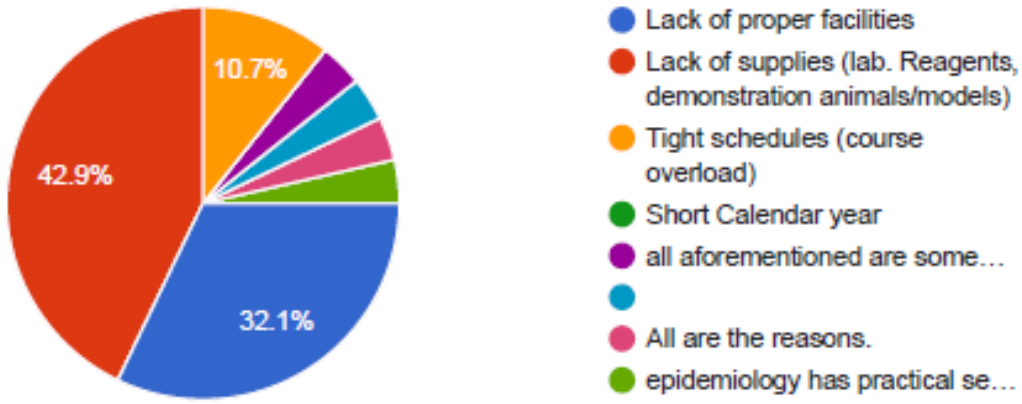


Figure 1. Reasons identified by instructors which hampered appropriated utilization of time allocated for practical sessions

The inclusion of national animal disease prevention and control strategy was indicated by 48.8%, national animal disease surveillance and reporting system by 31.7% and national animal health legislation, proclamations and legal frame by 31.7%. Fourteen (34.1%) of the instructors indicated the inclusion of none of the national animal health strategy into the curriculum. Figure 2 depicts the national Animal health delivery systems are included in the veterinary courses.

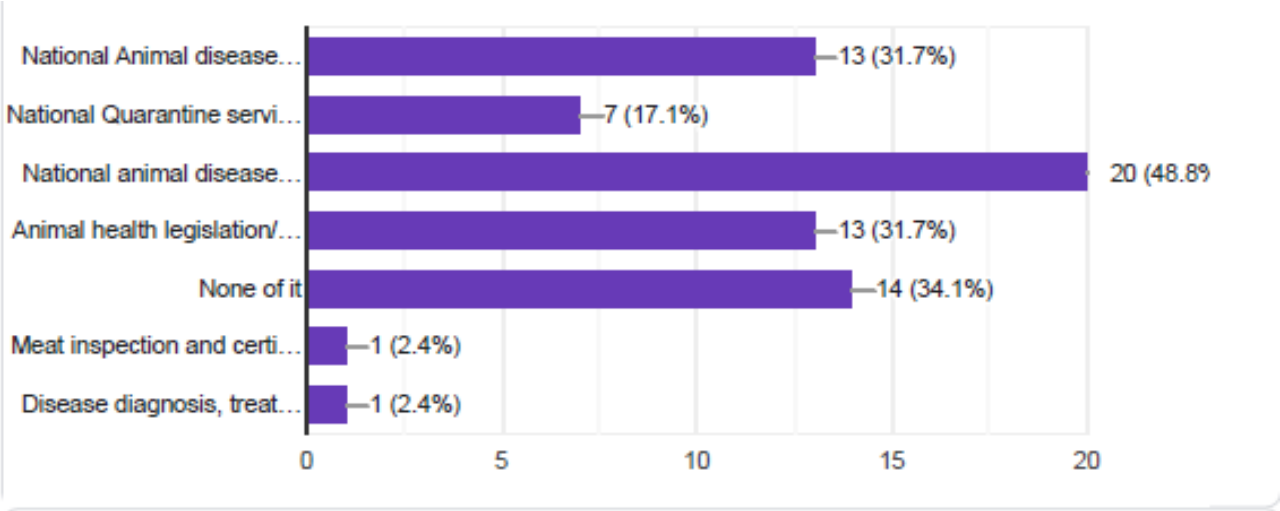


Figure 2. The various National Animal Health Strategy included in the veterinary curricula at present

4.2.2. Infrastructure and Facilities

Sixty-nine point four percent (68.3%) of the instructors disclosed the existence of clear policy on the minimum qualification and rank to deliver lectures for the DVM, MSc and PhD programs and 31.7% indicated that there is no such policy. The availability of sufficient lecture rooms to provide the courses as per the schedule was indicated by 73.2% while 26.8% indicated that they are not sufficient. The classroom facility (chair, table, black/whiteboard, projector, LCD, etc.,) was rated as excellent by 12.2% and poor by 9.8% as shown in figure 3. The linkage of the academic institution with industry or external livestock sector was assessed by staff as very weak (19.5%), weak (34.1%), fair (29.3%), strong (14.6%) and very strong (2.4%). The existence of Veterinary Teaching Hospital or clinic was revealed by 73.2% staff while 26.8% revealed its absence. When its existence was reported 90.3% indicated that it exists with the college compound while 9.7% revealed its location out of the campus.

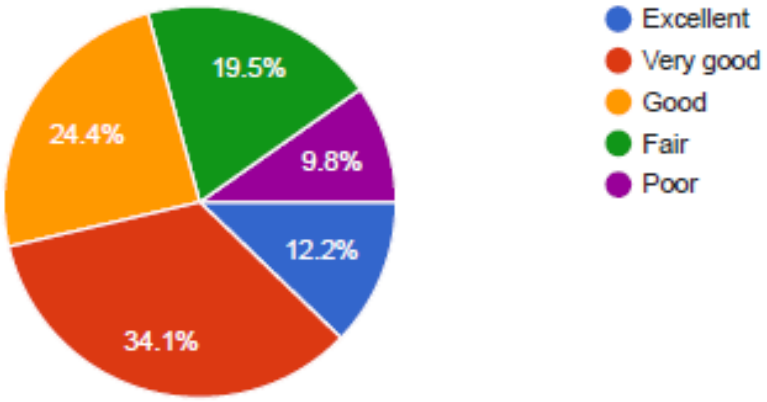


Figure 3. The rating of the suitability of class room facilities for provision of quality veterinary education

One-third of the staff (34.1%) indicated that students never have exposure to fluid and electrolytes and their therapeutic procedures; 58.5% indicated they use them only sometimes while only 7.3% revealed that they used them frequently. The exposure of students to vaccines and vaccination were judged as some sort of exposure to some of vaccine (39%), no exposure at all (29.3%), have exposure to vaccines but not vaccination (26.8%), got exposure to all vaccines (2.4%) and 2.4% were not sure of students exposure to vaccines and vaccination. Most of the instructors (61%) indicated students' hands-on practice in prescribing and administration of different drugs is limited while only 14.6% claimed that students had hands-on practice in prescribing and administration of all classes of drugs (Table 1). Only 14.6% and 2.4% revealed the existence of enough clinical and obstetrical equipment on the hospital/clinic for students practice (Table 2). In a similar way 29.3% of the instructors indicated the lack of surgical room and only 36.6% revealed the availability of surgical room with tables, light and surgical kits (Table 2). The students' acquisition of clinical experience with different clinical cases for all type of animals was judged as not enough (65.9%); 85% and 60% indicated that students were acquainted with ruminant and equine medicine, respectively.

Table 1. The results of assessment of experience of students in prescribing and use of various therapeutic arsenals

Responses	Number of respondents	Percentage
Have experience on all drugs	4	11.1
Have experience on antimicrobials	15	41.7
Have experience on anthelmintic	14	38.9
Have experience on antiseptics	13	36.1
Have experience on anesthetics	6	16.7
Have only limited experience on use of drugs	23	63.9
Have never used drugs	2	5.6

Table 2. Clinical, surgical and obstetrical experiences of veterinary students

Response	Number of respondents	Percentage
Enough clinical equipment	4	11.1
Not enough clinical equipment for all types of clinical practices	19	52.8
Enough obstetrical equipment	1	2.8
Not enough obstetrical equipment	9	25
Enough clinical and obstetrical equipment	3	8.3
Not Enough clinical and obstetrical equipment	7	19.4
No teaching hospital/clinic	4	11.1
Available surgical room with tables, light and surgical kits	10	27.8
Available surgical room with tables but not light	5	13.9
Available surgical room and light but no surgical kit	2	5.6
Available surgical room but no tables, light and surgical kit	7	19.4
No surgical room	12	33.3

Nearly half (48.8%) of the instructors indicated that students did not get sufficient exposure with sample collection from different animal species whereas only 34.1% were confident that they get sufficient exposure with sample collection. Seventy-three point two percent, 46.3% and 80.5% respectively rated the students' clinical experience, skill in surgical procedures and farm animal practices as poor. More than half (62.1) indicated the availability of own farms in the university compound while the rest use either commercial or smallholder farms for farm exposure. The reasons for poor or insufficient farm experience were pointed out to be insufficient schedule (51.5%) followed by unwilling ness of farm owners (36.4%) and the distance of the farms away from the campus (12.1%). The availability of abattoir/meat inspection schedule for students was revealed by 65.9% although 85.2% rated it as insufficient.

The laboratory facilities available were parasitology (97.6%) and microbiology (97.6% each) and anatomy (92.7%) (figure 4). The adequacy of the laboratory facilities was rated as sufficiently available (24.4%), somewhat available (56.1%) and insufficient (19.5%). The students' hands-on laboratory practice was judged as enough (24.4%), somewhat enough (46.3%) and not enough (29.3%). The overall students' laboratory experience was rated as satisfactory (24.4%), fair (39%) and unsatisfactory (36.6%).

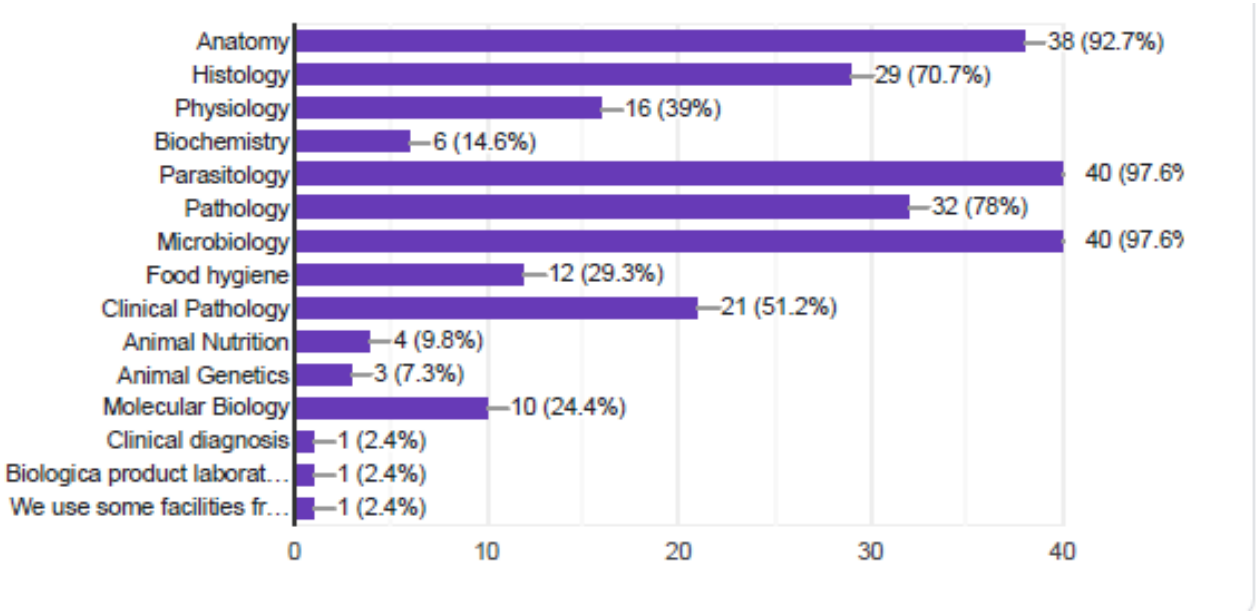


Figure 4. The availability of various laboratories at the veterinary teaching institutions in Ethiopia

The use of visual and audio-visual aids was reported by 70.7% and 73.2% of the staff, respectively; 85.4% of instructors revealed use of instructor-centered teaching method while only 22% use learning by reflection approach. The overall quality of veterinary education in Ethiopia was rated as poor (29.3%), satisfactory (24.4%), good (34.1%), very good (12.2%) and excellent (0.0%).

4.2.3. Student Feedback

Most of the staff (58.5%) indicated that they did not have a student feedback platform while 41.5% revealed the existence of the student feedback platform. However, of those who reported the existence of student feedback platform only 9.8% use the feedback regularly while 34.1% use it only sometimes. The vast majority (56.1%) did not use student feedback for any purpose.

4.2.4. Student Assessment Methods

The student assessment methods used by the instructors are individual instructor's interest driven (43.9%), standardized assessment methods set by examination committee (48.8%) and only very few reported other assessment methods. The assessment methods were described as non-competence based by 48.8% while 51.2% indicated it is competence based. The existence of quality assurance protocol was known to 53.7% of the staff while 46.3% did not know if any such protocols exist. The majority (65.9%) of the staff revealed the availability of clear policies and procedures for staff recruitment, promotion and retention whereas 34.1% revealed its absence. Nearly half of the staff (48.8%) agrees that promotion of staff is based on qualification, competence and skills whereas 22.2% held neutral position. The availability of incentive and award mechanism for best-performing staff is revealed only by 4.9% of the staff while 95.1% indicated it is absent.

4.3. Students' Responses

4.3.1. The Choice of the Program

Of the 104 students responded 38.5% indicated that veterinary program was their first choice, 22.1% indicated it was their second choice, 8.7% indicated it was their 3rd choice, 14.4% indicated it was 4th choice, 12.5% indicated it was above 4th choice and 3.8% did not choose it at all.

4.3.2. Curriculum Standards, Infrastructure and Facilities

Students indicated the availability of enough lecture rooms to provide the courses as per the schedule (81.7%) while 18.3% indicated the inadequacy of lecture rooms. The facility (chair, table, black/white board) of the lecture rooms were rated as poor (5.8%), fair (3.8%), good (24%), very good (43.3%) and excellent (23.1%). The availability of teaching hospital was indicated by 74% whereas 26% revealed its absence. Of those who indicated its presence, 75% disclosed that it is within the campus while 25% revealed that it is outside the campus. The availability of fluid and electrolyte was judge as always available (15.4%), sometimes available (53.8%) and never available (30.8%). The availability of anesthetic drugs was also rated as always available (25%), sometimes available (60.6%) and never available (14.4%). Only 20.2% of the students indicated the availability vaccines at the clinic/hospital; 50% revealed vaccines are available only sometimes and 29.8% of the students never been exposed to vaccines. When asked about exposure to different class of antimicrobial drugs only 37.5% of the students indicated their regular availability and use; 48.1% indicated they are available only sometimes while 14.4% of them never used antimicrobials. The students revealed better availability and exposure to different anthelmintic drugs; 47.1% revealed they are always available; 37.5% indicated they are available only sometimes whereas 15.4% revealed they have never used anthelmintic drugs. The availability of disinfectants was rated as always available (59.6%), sometimes available (38.5%) and never available (1.9%).

The availability of different types and number of clinical equipment for physical clinical examination and treatment was indicated as insufficient (68.3%) while 31.7% of the students revealed they are sufficient. Similarly 63.5% of the students indicated that types and number of surgical and obstetrical equipment is insufficient while 36.5% revealed that they are sufficient. The availability of enough surgical room with suitable surgical tables and light was indicated by 37.5% while 62.5% of them showed its absence. Similar to the instructors' response the majority of the students indicated the availability of parasitology (92.3%), microbiology (89.4%) and anatomy (88.5%) laboratories. However, only half of the students (50%) indicated the availability of sufficient laboratory facilities; 44.2% indicated the availability of laboratory facilities to be only sometimes and 5.8% of them revealed that the laboratory facilities were not sufficient for practical training. Interestingly only 33.7% of the students indicated that the laboratory class provides sufficient time and opportunities for practical training; 40.4% indicated that sufficient time and opportunities for practical training were provided somehow and 26% indicated that it is not sufficient. The majority of the students (63.5%) revealed having opportunity to conduct hands on laboratory practice while 36.5% disclosed theta they did not have opportunity to conduct hands on laboratory practice. The laboratory practical sessions were rated as satisfactory (28.8%), fair (42.3%) and unsatisfactory (28.8%).

4.3.3. Standards of Teaching

The teaching methods used by the instructors are mostly visual aids (62.5%) and audio-visual aids (54.8%). The overall teaching methods used by the instructors were indicated as participatory (76%), instructor-centered (14.4%) and very few students indicated other teaching methods. Only 38.5% of the students revealed that instructors used interactive method; 56.7% indicated it only sometimes that the instructors used interactive methods while 4.8% revealed that the instructors never use interactive methods. The overall quality of education at the veterinary educational establishments was rated as excellent (7.7%) and poor (14.4%).

The veterinary teaching hospital/clinic was indicated to be accessible for clinical practice any time needed (51%) but 49% said it was not accessible. The clinical practice schedule was once per week (76%), twice per week (9.6%), three times per week (5.8%) and rarely more than three days per week. The majority (56.7%) of the students revealed that instructors were not available for clinical practice while 43.3% indicated their presence. The acquisition of sufficient clinical experience for all type of animals was revealed by only 29.8% while 70.2% indicated that they did not acquire enough experience. Consequently, only 34.6% of the students were confident to handle any clinical case independently whereas 65.4% were not confident. The skill and motivation of instructors to train student during clinical practical session was rated as high (22.1%), moderate (62.5%) and low (15.4%).

Nearly half (49%) of the students were not exposed to enough number and types cases of different animal species at the clinic; 47.1% had never administered anesthesia to animals; 31.7% still need assistance in administering anesthesia and only 21.2% administered anesthesia. The majority of the students lack experience in blood sample collection from different animal species; either never practiced (22.1%) or still need mentor (33.75) while 44.2% had practiced it. Only 29.8% of the students administered intravenous fluids and drugs; 39.4% of them never practiced intravenous administration and 30.8% need assistance. The surgical practical session and surgical skills were rated as sufficient (39.4%) and insufficient (60.6%). Only 27.9% indicated the availability different animal species (cattle, sheep, goats and chicken) for practical sessions; 54.8% revealed these animals are available only sometimes and 15.4% said they are never available. Few (28.8%) of the students were able to conduct minor surgery independently; 40.4% did not conduct any such surgery and 30.8% were not confident. When asked about major surgery, 72.1% were not confident to do it; only 5.8% were confident to do and the rest (22.1%) held neutral position. The existence of abattoir/meat inspection schedule was indicated by 34.6% of the students while 65.4% indicated its absence. The absence of farm practice schedule was revealed by 55.8% of students but 44.2% indicated it exists; 75.3% indicated that the schedule was insufficient while 24.7% said it was sufficient. Attachment of students to commercial livestock farms for practice was by 22.1% and 77.9% revealed absence any attachment. The livestock farm (dairy and poultry) practice was rated as sufficient (32.7%) and insufficient (67.3%). Confidence in critical farm practice was acquired by 57.7% and 42.3% did not acquire the confidence and ability in critical farm practice. The availability of livestock farms for practice was revealed by 73.1% while 26.9% revealed its absence however, 57.3% indicated that the farms are located outside the campus. The inclusion of the national animal health strategy in the courses was indicated by 51.9% (national animal disease prevention and control) and animal health legislation (41.3%).

4.4. Deans' Responses

4.4.1. Deans' Responses on the General Aspect of the Academic Institutions

Of the nine universities contacted only Jimma, Semera, Ambo, Hawassa and Jigjiga Universities provided responses. The average number of year 2 and above undergraduate students attending veterinary education at these universities was 198. Three of them were organized at college level; one was organized at faculty level and the other one was organized at school level. They have both veterinary (DVM) and para-veterinary programs (BSc, VLT) programs. The source of finance for all was government allocated budget which did not take into account the demanding nature of the veterinary courses/programs (75%) and was insufficient for research and community engagement (development activities) (100%). Most of the deans (71.4%) indicated that the budget allocated for teaching activities was inadequate as well. Clinical services were used as an additional source of finance by one of the college deans.

4.4.2. Student Selection and Admission

Some of the colleges (83.3%) disclosed the existence of student selection and admission guidelines/strategies although not all have guidelines to ensure that students admitted meet minimum general and program specific requirements. However, the admission criteria used were those general criteria set by the Ministry of Education which is not specific to veterinary education. One college, however, indicated that it has its own criteria for admission of veterinary students that is based on the CGPA and entrance examination. Four (83.3%) of the deans revealed that they have regular monitoring, evaluation and benchmarking for the improvement of student enrolment although they reported very variable retention rate. The student retention varied across the veterinary teaching institutions. All of the deans revealed the existence of student counseling on academic issues but counseling on financial issues, health and personal problems and career and related guidance is reported only two of them.

4.4.3. Academic Staff and Program Management

The average employment rate was variable. The academic staff profiles of each college also vary greatly. In some of the colleges the maximum qualification is MSc/MVSc and in terms of rank most of the colleges have staff whose rank ranges from lectures to associate professor. Some of the college deans (33.3%) revealed that they do not have human resource development plan and retention. Five (83.3%) of the colleges do not have incentive and award mechanism for best performing staffs but all of them reported qualification, competence and skills based staff promotion and 83.3% revealed that they have adequate, qualified and competent staff for each course with pedagogical skills. Four (66.7%) of the deans indicated the existence of clear policies and procedures

for continuous staff development; Five (83.3%) indicated that there were inadequate staff facilities and services (house, transport service, professional allowance and 50% did not undertake periodic monitoring, evaluation, and appraisal of staff.

4.4.4. Curriculum Standards

All of the deans disclosed the existence of standard veterinary education curriculum, which is a harmonized one. Four (66.7%) of the colleges Deans indicated regular revision of the curriculum (every three years). The actors involved in the curriculum design and review include academic staff (100%), department heads (83.3%), students (33.3%), stakeholders from federal government (50%), stakeholders from regional government (50%) and NGOs (33.33%). Five of the college Deans revealed the existence of guidelines, procedures and processes for introducing new programs with learning outcomes that are competence-based.

The proportion of time allocated to practical classes was revealed to vary across the institutions ranging from 25% to 30% although none of the Deans indicated the actual time used for practical trainings. However, three of the college Deans (50%) revealed that the time used for practical training was sufficient; one (16.7%) indicated that it was not sufficient but two (33.3%) did not provide response. The duration of one academic semester reported by each dean was variable although they follow harmonized curriculum. One reported 12 weeks; one reported 14 – 16 weeks; three reported 16 weeks and the other reported 18 weeks and five (83.3%) of them think that the allocated academic weeks per semester was not enough. Academic weeks ranging from 16 to 25 were suggested although 50% of the deans suggested 20 weeks. Most (66.7%) of the deans indicated that they follow the academic program as planned; five (83.3%) of them revealed that they have guidelines and procedures to ensure coherence and academic standard for each courses although none have provided the standard. Two (33.3%) of the college deans revealed that the program or course content and design did not take into account the learners' needs and market demand and 50% indicated that it did not take into account the availability of financial resources and facilities. Three (50%) of the college deans indicated the curricula did not incorporated national animal disease surveillance and reporting systems and veterinary legislations/proclamations/legal framework.

4.4.5. Standards of Teaching

Only (66.7%) four deans provided the instructor to student ratio, which was 1: 16 (two deans), 1:8 (one dean) and 1:6 (one dean). The availability of enough lecture rooms to provide the courses as per the schedule was indicated by 67.7% of the deans. The class room facility (chair, table, black/white board, projector, LCD, etc.,) was rated as poor (16.7%), good (33.3%), very good (33.3%) and excellent (16.7%). The existence of own teaching hospital/clinic was indicated by 66.7% of the deans. The hospitals/clinics however, did not avail fluid and electrolytes for students to practice

(33.3%); avail only sometimes (50%); expose students to some vaccines for practice (66.7%), demonstrate vaccines but not vaccination (16.7%) and 16.7% did not have vaccines for demonstration and practice. The availability of antibiotics (66.7%), anthelminthic (66.7%) and antiseptics (50%) was revealed whereas the availability of anesthetics for students to practice was indicated only by one dean (16.7%). The availability of enough number and types of equipment for clinical examination and treatment was reported by only 16.7% and yet 66.7% reported the availability of equipment which is not sufficient for all clinical practices. The availability of enough surgical room and equipment for surgical practices was reported by 50% while 50% reported its absence. As a result 50% of the deans feel that students did not acquired enough clinical experience with different clinical cases for all type of animals during their courses and they are not confident that they handle clinical cases independently. They rate the students' clinical experience to be insufficient (33.3%) and sufficient (66.7%). Five (83.3%) of the deans rated their students' surgical skill as insufficient while only 16.7% rated as sufficient. Moreover, 66.7% of the deans revealed that their students did not get sufficient farm animal management practices as they lack their own farm and they rated the students' farm practice as insufficient. The unwillingness of the farm owners, the distance of the farms from the college and the shortage of time allocated for farm practices are reasons suggested by the deans. Similarly 66.7% of the deans indicated that they did not have regular abattoir/meat inspection schedule for students and 83.3% rated the students' meat inspection practice as insufficient.

On one hand the deans revealed that sufficient laboratory facilities are available only for anatomy (100%), parasitology (100%), microbiology (100%), pathology (83.3%), clinical pathology (83.3%) and histology (66.7%). On the other hand only 50% indicated that the laboratory facilities are sufficiently available for practical sessions. Laboratory facilities are lacking for the rest of courses offered. Although 100% of the deans indicated that laboratory sessions are conducted by both instructors and laboratory assistants, they rated the overall laboratory experiences of their students as satisfactory (50%), fair (33.35) and unsatisfactory (16.7%). In addition, 66.7% of the deans indicated that their students got sufficient time and opportunities for hands on laboratory practice and 50% indicated students get experience in sample collection from various animal species.

4.4.6. Student Feedback

Four (66.7%) of the deans disclosed the existence a platform for students to reflect on their learning experience which is based on the self-assessment (50%) and through course assessment questionnaire (50%). Similarly 66.7% of the deans revealed the existence of mechanisms to evaluate the fitness for the purpose of their programs (student feedback). However, only 1 (16.7%) of the deans revealed the existence of mechanisms for feedback from stakeholders on their graduates' performances (fitness for the purpose of the curriculum).

4.4.7. Student Assessment Methods

The college deans were enquired on the student assessment methods. Five (83.35) of the deans disclosed that assessment methods are competence/outcome based but only four (66.7%) of the deans indicated the existence of monitoring mechanisms for examination malpractice. Five (83.3%) of the deans revealed the presence of a quality assurance protocol which is not known and implemented by staffs and students (33.3%).

5. DISCUSSION

5.1. Student Selection and Admission

As it is indicated in the results veterinary colleges/schools do not have a clear policy and standards regarding student selection and admission. The responses of students also clearly showed that veterinary program is not the first choice for the vast majority. Although there are proclamations that empower the Federal Ministry of Education to determine criteria for admission to higher institutions and qualification requirements such as Government proclamation 4/1995, a quality standard of education for veterinary degrees (DVM or MVSc or others) has not been established in the country. As the depth of scientific knowledge increases faster than ever future veterinary graduates are expected to deal with increasingly complicated and diverse problems. The budget allocated by the respective universities to the veterinary programs does not take into accounts the demanding nature of the field. Both these situations need to change if the student retention rate is to reach between 80% and 100%, (10) as hoped by the government. It is unrealistic to expect that veterinary teaching establishments will have enough financial and human resources to cover all the needs. Thus, it is important that teaching institutions need to devise mechanisms how extramural institutions can collaborate to fulfill some of these the financial requirements especially for practical experiences.

5.2. Curriculum Standards, Infrastructures and Facilities

The veterinary education in Ethiopia has followed the politics of production of veterinarians and para-veterinarians and duplication among various universities. The responses of the instructors and student clearly showed that it does not reflect its role, on the needs and realities of the country, and did not consider the importance of establishing veterinary education programs with the essential level of quality. Despite adoption of harmonized curricula the revision of the veterinary program curricula are not uniform across the faculties/colleges/schools. Curricula need to be designed to enable students acquire adequate general knowledge and technical expertise in the veterinary medical sciences; encourage them to continue learning via continuing professional development throughout their professional careers. Zemljic (2004) pinpointed that the curricula should give opportunity to students to acquire training in all subjects covering domestic and wild animals including emergency first aid for all species and clinical criteria for referral for more specialized veterinary treatment. In contrast the results of this survey revealed that students are not sufficiently acquainted with various therapeutic arsenals. They should acquire sufficient knowledge and skill in therapeutics, clinical, surgical abattoir and laboratory practices. The future veterinary graduates need to acquire basic training and knowledge in farm biosecurity and one health. In this way students will have the opportunity to study a particular area of veterinary science in more depth although by virtue

of its nature veterinary courses are omnicompetent. In general all aspects of the physical facilities must provide a conducive environment for teaching which should be sufficient to accommodate students and academic and support staff. Each veterinary teaching institution must have or be associated with a veterinary hospital to provide best practice in veterinary medicine and surgery. Sufficient and appropriately designed facilities for housing animals used in teaching and research must be available. The veterinary students should also gain sufficient exposure to various animals in order to develop good attitudes and understand their behavior, which is very important for their future career. To achieve good results the veterinary teaching institutions should have extramural schedules in order to acquaint students with different animal species, their behavior and develop positive attitudes towards animals. In contrast the responses of instructors and students revealed that both the curricula and the syllabi give more weight to ruminants. In addition the clinical and laboratory facilities available at the veterinary teaching institutions are in adequate to achieve the desired results.

The veterinary teaching institutions need to know that there are increasing public expectations regarding the level and quality of services provided by the veterinary graduates. Therefore, it is necessary to set standards for the future curricula. In the first place it must to introduce the veterinary students to the importance of lifelong learning for those who want to be veterinarians. Second, rather than having both veterinary and para-veterinary programs it is advisable stick to a DVM program with least six years of full-time theoretical and practical study. It is very important to design programs combining basic knowledge with more practical training than is given at present. This "hands-on" training can be achieved only by organizing extramural studies in accredited outside institutions. A national veterinary statutory body (council) is urgently needed in order to establish and enforce quality standards for veterinary education. Design of competence-based programs that will fit the purpose and provision of standard education aiming at achieving an internationally recognized degree should be ensured.

5.3. Standards of Teaching

The veterinary teaching institution in Ethiopia used old-fashioned teaching methods (classical lectures alone). Veterinary students are not acquiring sufficient hands on-practice in clinical and surgical cases; they lack confidence in farm management and poor experience in sample collection and processing. These are very important and expected for day competence. To achieve good results this old-fashioned teaching methods should be replaced by modern didactic and participatory methods (learning by reflection) and due focus needs to be given to practical training for greater retention of knowledge and skills (Iles, 2002). In addition, the teaching standards should take into account a certain ratio of instructors to students ranging from 1:5 to 1:8 (Zemljic, 2004). According to this recommendation the instructors to students ratio reported by few of the college Dens is 1:6, which is quite good. However, since only five deans responded to the survey, it is very difficult to infer this ratio to all veterinary teaching institutions. It was also clear that the veterinary teaching

institutions have varying number of academic staff with variable level of qualification and ranks although the curricula are harmonized. Instructors must be chosen according to their ability and specialization to the best interest of the students, which in other words means, to the best interests of community, client, and patient. Hence, veterinary students should get sufficient exposure to clinical and surgical cases as well as farm practices and abattoir works to ensure enough hands-on practice, which is rated low in this survey. This is necessary for the development of clinical skills through the student's full involvement in the case management and problem-solving skills in farm management and food safety. That is, veterinary graduates need not only biomedical knowledge but also economics of animal production and community health. Thus, veterinary students must be familiarized with the principles of "from farm to table" and all students must gain hands-on such practices. It is therefore, important to re-consider the practical training and improve the actual time allocated to practical teaching.

5.4. Quality Control

Although few veterinary teaching institutions indicated the existence of guidelines for control of to ensure academic standards, none have provided written evidence. Quality control systems that evaluate 1) the facilities, 2) academic standards, 3) the quality of methods of teaching, learning, and assessment, 4) the outcome of the process (the students and their knowledge and experience at the time of graduation) is important. Regular evaluation of the hardware (veterinary teaching institutions and their organization) and the software (graduates and their ability to cope with problems in practice) is crucial.

To achieve good academic standards the veterinary teaching institutions need to develop quality control mechanisms that identify the strengths and weaknesses of the training they provide. It is very important that the veterinary profession set standards for veterinary education in accordance with the needs of community, clients, and patients. For example the veterinary teaching in Ethiopia should be more oriented towards small-holder, mixed-farming systems and pastoralism including care for draught animals, herd/flock health, transboundary diseases, and zoonoses. The importance of adapting the veterinary teaching program to regional and cultural features has been recommended by Sylvester (2003). On top of this, the performance of teaching institutions needs to be evaluated by both internal and external bodies in a transparent (the outcome of the evaluation is made public), open (the evaluation scheme can be challenged and improved whenever necessary) and independent (there are no conflicts of interest for those involved in the evaluation process) as pointed out by Zemljic (2004). The main requirement is the capability to single out those veterinary teaching establishments that meet a set of standards considered essential for the quality of training in veterinary medicine. The evaluation must be done by the profession itself through collaboration between the practicing and teaching sides of the profession.

The veterinary teaching institutions should have a mechanism for student engagement in the quality matters at all levels. The feedback from students and employers (outcome assessment) can be used to improve the quality of the degree programs in the veterinary schools and ensure translation into student learning experience. Outcomes assessment targeting at graduate destination surveys and surveys of employers should be carried out by each veterinary teaching institution to show that graduates have acquired day one skills. In addition, there should be students' representative council to work to maintain an effective system of student representation to ensure their participation at all levels. The staff should explain the purpose of collecting feedback, the methods that will be utilized, how it will be analyzed, how and when the findings will be considered and how actions will be taken as a result. Students should be encouraged to reflect on their learning experience and the responses should be communicated to the students and staff. The academic staff should also use a variety of mechanisms to obtain student feedback to promote dialogue mainly through course evaluation questionnaires. The veterinary teaching institutions should have to set out requirements for gathering course evaluation data from students via questionnaires in their Course Evaluation Policy. The questionnaire should focus on the courses not on individuals. The policy should cover means of collecting, presenting and responding to the questionnaire data. A formal feedback system whereby program graduates contribute to periodic reviews of the curricula, which would be helpful to orient the veterinary education program to the real veterinary needs of the country or the region has been emphasized (De Deken et al., 2004).

6. CONCLUSIONS AND RECOMMENDATIONS

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The Ethiopian veterinary education is currently sub-standard. The curricula do not demonstrate the stimulation of enquiry, development of analytical and problem-solving abilities and promotion of professional attitudes in students. The veterinary students are not acquainted with a standard knowledge, skills, professional attributes in clinical, surgical, laboratory and farm anima practices commensurate with what have been listed in the curricula and the 'day one' skills specified by WOAH. The budget allocated to veterinary teaching institutions by their respective universities does nor commensurate with the financial demands of the program.

Therefore, the following recommendations are suggested:

1. The organizational structures, the facilities, standards of teaching and farm animal resources must be improved

2. The veterinary curricula need to be regularly revised to meet the national and international demands

3. The new veterinary curriculum must include continuing education programs in order to ensure lifelong learning

4. There should be adequate finances to sustain the veterinary educational programs

5. Both internal and external quality control mechanisms should be in place to monitor and evaluate the quality of veterinary education should established

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