Technical Report
Qualifying Examination
August 15, 2002 and January 2, 2003 Test Administrations

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I. Introduction

The primary objective of the Qualifying Examination (QE) is to provide a comprehensive objective examination in basic veterinary medical sciences for use by the Program for the Assessment of Veterinary Education Equivalence (PAVE) of the American Association of Veterinary State Boards in evaluating the education equivalence of veterinarians who are graduates of veterinary schools not accredited by the Council on Education of the American Veterinary Medical Association. In addressing this objective, the QE also protects the public by ensuring that veterinarians demonstrate a specified level of knowledge and skills before entering veterinary practice, and provides a common standard in the evaluation of candidates that will be comparable from jurisdiction to jurisdiction.

II. Test Development

Qualifying Examination test development is done in cooperation with the National Board of Medical Examiners (NBME). In June 2000, the NBVME Executive Committee outlined the format of the examination and approved plans for its development. The QE was based on the North American Veterinary Licensing Examination (NAVLE) job analysis, which was prepared for the NBVME by the Professional Examination Service, and approved in 1997. The NAVLE job analysis contains an extensive list of knowledge statements that were useful in developing the QE. Knowledge statements that addressed basic science content areas were grouped into five broad categories: anatomy, physiology, pharmacology, microbiology, and pathology.

The NBVME then analyzed the curriculums of four veterinary schools in order to get an idea of what subjects were covered in the pre-clinical portion of the curriculum, and how much time was devoted to the various subject areas. This analysis also allowed identification of any content areas that were not included in the knowledge statements from the job analysis.

The NBVME assembled a panel of content experts to help finalize the test blueprint and begin the process of constructing the examination. These individuals (Appendix 1) met at NBME headquarters in Philadelphia in December 2000. They reviewed the draft test blueprint, made several changes to it, and assigned weights to the various content categories. The results of this work were presented to the NBVME at its January 2001 meeting, and the final test blueprint, as listed in the QE candidate bulletin, was approved.

QE Item Writers for 2001 are listed in Appendix 2. Items submitted by the writers were edited by NBME staff for consistency of format and terminology and sent back to the authors for review. Authors gave feedback and a second edit was undertaken. Finally, the item writers met face-to-face to further review the items and assemble draft forms of the exam. The final review of QE forms to be administrated in August 2002 and January 2003 was done by Drs. Don Draper, Jan Krehbiel, and Michael Groves (NBVME members) and Dr. John Boyce (NBVME staff).

All of the individuals serving as QE item writers and reviewers have present or former experience teaching in their respective discipline at AVMA-accredited veterinary schools.

III. Examination Analysis

A. Summary Statistics

Summary statistics for the August 15, 2002 and January 2, 2003 Qualifying Examination are provided in Table 1. The mean P-value is an indication of the difficulty of the test and represents the proportion of items answered correctly by the average candidate. The standard deviation represents the variability of item difficulties around the mean.

P-values are influenced both by the inherent difficulty of the items and by the ability of the candidates. Because changes in mean P-value from one year to the next could reflect item difficulty, candidate ability, or both, comparisons across years have limited value and should be made with caution.

Also shown in Table 1 is the mean discrimination index. This index is the point-biserial correlation coefficient ($r_{p\text{-}bis}$) between the item score and the total test score and indicates how well an item separates high scoring from low scoring candidates. On average, the items have adequate discrimination. The standard deviation of $r_{p\text{-}bis}$ represents the variation in item discriminations around the mean value.

The reliability coefficient (KR_{20}) is a measure of internal consistency that provides an estimate of the accuracy or stability of scores. An examination is reliable to the extent that administration of a different, random sample of items of the same size and from the same content area would result in little or no change in a candidate's rank order in the group. Possible values of the coefficient range from 0 to 1. The reliability coefficients for the August 2002 and January 2003 forms of the QE are .84 and .81, respectively.

B. Standard Setting

On September 13, 2002, the NBVME convened a standard setting panel at the NBME office in Philadelphia to establish a criterion-referenced or content-based passing score for the QE. Members of the panel are listed in Appendix 3.

NBME staff assisted the panel in using the modified Angoff procedure to establish a criterion-referenced passing standard. After an initial orientation and training session, panel members individually rated the difficulty of each item on the examination. A total of 290 items were rated; 10 items had been deleted from the examination after the August administration as part of the key validation process. The judges first rated each item without data, and then looked at the performance of the candidates on the item and had an opportunity to adjust their rating based on that information. The mean initial and final ratings were within 1% of each other. The results of the standard setting meeting were presented to the NBVME members, and the final passing standard was approved by the NBVME Executive Committee during a conference call on September 24.

C. August 15, 2002 Administration

A total of 33 PAVE candidates took the QE at Prometric testing centers on August 15. Using the criterion-referenced passing standard approved by the NBVME, the NBME scored the exam and reported scores to the AAVSB on September 27. Twenty-eight of the 33 candidates passed. Scores were reported on a scale with a mean of 250 and a standard deviation of 50. On that scale, the passing point was 203.

D. January 2, 2003 Administration

A total of 36 PAVE candidates took the QE at Prometric testing centers on January 2. Using the criterion-referenced passing standard approved by the NBVME, the NBME scored the exam and reported scores to the AAVSB on February 8. Twenty-five of the 36 candidates passed. The scores were reported on the same scale used for the August 2002 examination.

E. Appendices

Appendix 1 - December 2000 QE Item Review Panel
Appendix 2 - 2001 QE Item Writers
Appendix 3 - 2002 QE Standard Setting Panel

Table 1
Summary Statistics Based on Total Group of Candidates

Number of Items Scored (Deleted)		Mean P-Value (Standard Deviation)	
August 2002	**January 2003**	**August 2002**	**January 2003**
290 (10)	287 (13)	.60 (.26)	.55 (.25)

Mean Discrimination Index: $r_{p\text{-}bis}$ (Standard Deviation)		KR_{20} Reliability Coefficient	
August 2002	**January 2003**	**August 2002**	**January 2003**
.13 (.19)	.10 (.18)	.84	.81

Appendix 1

December 2000 QE Item Review Panel

Name	Affiliation	Discipline
Dr. Franklin Ahrens	Iowa State University	Pharmacology
Dr. Charles Short	Louisiana State University	Pharmacology
Dr. James Herman	Texas A & M University	Physiology
Dr. Earl Dixon	Tuskegee University	Physiology
Dr. P. MohanKumar	Michigan State University	Anatomy
Dr. Diana Rosenstein	Michigan State University	Radiology
Dr. Suzette LeClerc	University of Saskatchewan	Clinical Pathology
Dr. Jill McCutcheon	University of Guelph	Pathology
Dr. Dieter Schifferli	University of Pennsylvania	Bacteriology and Immunology
Dr. Charles Hendrix	Auburn University	Parasitology

Appendix 2

2001 QE Item Writers

Name	Affiliation	Discipline
Dr. Charles Short	Louisiana State University	Pharmacology
Dr. James Herman	Texas A & M University	Physiology
Dr. P. MohanKumar	Michigan State University	Anatomy
Dr. Diana Rosenstein	Michigan State University	Radiology
Dr. Suzette LeClerc	University of Saskatchewan	Clinical Pathology
Dr. Jill McCutcheon	University of Guelph	Pathology
Dr. Franklin Ahrens	Iowa State University	Pharmacology
Dr. Evelyn Kazacos	Purdue University	Pathology
Dr. Sheba MohanKumar	Michigan State University	Histology
Dr. William Lawrence	University of Pennsylvania	Virology
Dr. John Boyce	National Board of Veterinary Medical Examiners staff	Bacteriology and Mycology

Appendix 3
2002 QE Standard Setting Panel*

Name	Affiliation	Discipline
Dr. Marc Ratzlaff	Washington State University	Anatomy
Dr. Walter Hsu	Iowa State University	Physiology and Pharmacology
Dr. Cliff Monahan	Ohio State University	Parasitology
Dr. Mark Kuhlenschmidt	University of Illinois	Bacteriology
Dr. Alfonso Lopez	University of Prince Edward Island	Pathology
Dr. John Van Vleet	Purdue University	Pathology
Dr. Amanda Fales-Williams	Iowa State University	Clinical Pathology
Dr. Don Draper	National Board of Veterinary Medical Examiners member	Anatomy
Dr. Jan Krehbiel	National Board of Veterinary Medical Examiners member	Pathology
Dr. Dale Boyle	National Board of Veterinary Medical Examiners member	Public Health
Dr. Deborah Kochevar	Texas A & M University	Physiology
Dr. Sawkat Anwer	Tufts University	Pharmacology
Dr. Anne Zajac	Virginia Tech	Parasitology
Dr. Paul Gibbs	University of Florida	Virology
Dr. Tom Purinton	University of Georgia	Anatomy

* The panel also included four veterinary students - two from Michigan State, one from Iowa State, and one from Louisiana State.