

**Technical Report**  
**Qualifying Examination**  
**August 14, 2003 and January 2, 2004 Test Administrations**

National Board of Veterinary Medical Examiners  
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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). The NBVME identified 10 veterinarians to write items for examinations to be administered in August 2003 and January 2004 (Appendix 1). An item-writing workshop was conducted at the NBME offices in Philadelphia on February 25, 2002. The purpose of the workshop was to provide the new item writers with guidelines for writing well-structured items and to hold a mock item review to demonstrate how to review items effectively.

After the workshop, NBME staff prepared item-writing assignments based on each item writer's specialty and the content categories. These assignments as well as an item-writing guide and instructions for submitting items were sent to each item writer.

All new items received from the item writers were edited and reviewed by NBME staff. The edited and annotated items and associated pictorials were reviewed by the item writers at a meeting at the NBME offices on September 12, 2002.

After the meeting, new approved items were reviewed again by NBME staff and added to the item pool for the Qualifying Examination. Two 300-item examination forms were generated using content and statistical constraints. Nine individuals met on February 25, 2003 to review the forms (Appendix 2). Groups of writers reviewed items within their areas of expertise, evaluating the quality of the items, identifying content overlap between items, and assessing the content equivalence of the two forms. NBME staff incorporated the committee suggestions and prepared updated forms. These examination forms were reviewed, revised as necessary, and approved by a final form review panel in May 2003 (Appendix 3).

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

### **III. Examination Analysis**

#### **A. Summary Statistics**

Summary statistics for all four forms of the Qualifying Examination administered to date 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 ( $r_{p-bis}$ ) 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  $r_{p-bis}$  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 2003 and January 2004 forms of the QE are .87/.91 and .93, respectively.

Key validation takes place after the examination is administered and before scores are derived. Items that are flagged by the computer as potentially flawed or mis-keyed are reviewed by content experts, and such items are re-keyed or deleted from the scoring key, as appropriate.

#### **B. Pass/Fail Rates**

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. NBME staff assisted the panel in using the modified Angoff procedure to establish a passing standard. The passing standard approved in September 2002 has been applied to each of the four forms of the QE administered to date. The NBVME Executive Committee reviews and approves the passing standard via conference call following each test administration. Table 2 provides the history of failure rates for the four QE forms.

#### **C. Appendices**

Appendix 1 - 2003-04 QE Item Writers

Appendix 2 - 2003-04 QE Form Reviewers

Appendix 3 - 2003-04 QE Final Form Reviewers

**Table 1**  
**Summary Statistics**

<b>Administration</b>	<b>N</b>	<b>Number of Items Scored (Deleted)</b>	<b>Mean P-Value (Standard Deviation)</b>	<b>Mean Discrimination Index: <i>rp-bis</i> (Standard Deviation)</b>	<b>KR20 Reliability Coefficient</b>
August 2002	33	290 (10)	.60 (.26)	.13 (.19)	.84
January 2003	36	287 (13)	.55 (.25)	.10 (.18)	.81
August 2003 Form 1	11	292 (8)	.59 (.24)	.14 (.32)	.87
August 2003 Form 2	7	297 (3)	.59 (.26)	.17 (.36)	.91
January 2004	29	297 (3)	.59 (.23)	.22 (.21)	.93

**Table 2**  
**History of Failure Rates**

<b>Administration</b>	<b>Total Group N</b>	<b>Number Failed</b>	<b>Failure Rate</b>
August 2002	33	5	15.2%
January 2003	36	11	30.6%
August 2003	18	2	11.1%
January 2004	30	9	30.0%

**Appendix 1**  
**2003-04 QE Item Writers**

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**Appendix 2**  
**2003-04 QE Form Reviewers**

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**Earl Dixon, PhD**

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**Appendix 3**  
**2003-04 QE Final Form Reviewers**

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