



Content Analysis Study Executive Summary Report

American Association of Veterinary State
Boards (AAVSB)

Program for the Assessment of Veterinary
Education Equivalence (PAVE)

Qualifying Science Examination (QSE)

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Submitted to:



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Executive Summary

The American Association of Veterinary State Boards (AAVSB®) owns and administers the Qualifying Science Examination (QSE) for Step 3 of the Program for the Assessment of Veterinary Education Equivalence (PAVE) program. The purpose of the QSE is to assess the basic veterinary sciences that are taught in the first three (3) years of the curriculum at AVMA COE-accredited (American Veterinary Medical Association Council on Education) veterinary colleges. A key step in the development of an examination is the validation of the exam specifications (also known as an exam content outline) that direct the content of the examination. By establishing valid exam specifications, the AAVSB will ensure each successive form of the QSE consistently assesses equivalent content.

This report describes the methodology and procedures used to conduct a content analysis study and develop the exam specifications for the American Association of Veterinary State Boards (AAVSB) Qualifying Science Examination (QSE).

The QSE content analysis study was conducted in accordance with principles and practices outlined in the *Standards for Educational and Psychological Testing*¹, which describe principles and guidelines for all aspects of test development, including content validation.

A content analysis study (sometimes known as a practice analysis, job task analysis, role delineation study, work analysis, or competency profiling) is a scientific inquiry conducted to identify professional competencies and the context in which the competencies are demonstrated². Different methods can be used which may differ in the levels of specificity in analyzing and describing different competency elements, with the choice of method largely dependent on the intended purpose and use of the results. The methodology of the current analysis was tailored to the creation of exam specifications for test development.

The three major activities that comprise the content analysis study process described in this report are as follows:

1. **Content Analysis Committee Meeting** – A gathering of subject matter experts (SMEs) to discuss and develop a description of the scope of basic veterinary sciences
2. **Content Analysis Survey** – A survey of veterinary sciences educators not involved with the SME panel to validate the knowledge statements developed by the committee
3. **Development of Examination Specifications** – The development of an Examination Content Outline by the committee based on the results of the survey

Several veterinary sciences educators and veterinary practitioners including PAVE Committee Members were assembled by the AAVSB to serve as subject matter experts (SMEs). The individuals selected (See Appendix A) represent a wide variety of professional characteristics such as years of experience, work setting, geographic location, and areas of specialty. This helps in developing a scope of knowledge for basic veterinary sciences that is reflective of the first 3 years of veterinary sciences education in AVMA COE-accredited veterinary medicine college programs. The results from the content analysis study become the basis of a validated assessment for the knowledge of basic veterinary sciences.

¹ American Educational Research Association, American Psychological Association, National Council on Measurement in Education (2014). *Standards for Educational and Psychological Testing*. Washington, DC: AERA.

² Sackett, P.R., Walmsley, P.T., Laczko, R.M. (2012). *Job and work analysis: Industrial and Organizational Psychology*. In N. Schmitt, S. Highhouse (Eds.), *Comprehensive Handbook of Psychology*, Volume 12. New York, NY: John Wiley and Sons.

The content analysis process utilized in this study yields exam specifications that accurately reflect the knowledge of basic veterinary sciences taught in AVMA COE-accredited veterinary medicine college programs allowing for the development of fair, accurate, and realistic assessments of education equivalence for graduates of international, non-AVMA COE-accredited veterinary colleges to practice in the United States and Canada. The resultant Examination Content Outline (Appendix B) indicates a 200-item examination with content distribution requirements at the knowledge domain (content domain) level as well as knowledge topic (content subdomain) level. The 6 major content domains are:

1. Normal Structure and Function
2. Concepts of Disease
3. Diagnostics
4. Therapeutic Intervention
5. Public Health and Disease Prevention
6. Professional Skills

Content Analysis Committee Meeting

PSI Services LLC (PSI) in collaboration with the AAVSB conducted a content analysis study meeting on the dates of October 19, 2019 through October 20, 2019 in Denver, Colorado with SMEs to discuss and develop a list of knowledge areas that reflect basic veterinary sciences education. PSI led the SMEs in refining knowledge topics, and organizing them into a domain and subdomain structure. The outgoing exam content outline was also used as a resource when developing the knowledge topics. Prior to the meeting, attendees were asked to provide lists of any additional knowledge topics they thought should be considered, and their feedback was used as resources. Additionally, PSI and the AAVSB collected and analyzed the first three years of the curriculum provided by AVMA COE-accredited veterinary medicine college programs, and the resultant information was discussed as well.

The content analysis study committee developed 30 knowledge topics across 6 content domains. Finally, the content analysis study committee discussed and approved the knowledge rating scales, the demographic questions, and survey coverage questions used in the content analysis survey.

Content Analysis Survey

PSI developed, administered, and monitored a survey to validate the knowledge areas developed by the content analysis study committee and to help determine content weighting. To this end, the survey collected respondents' emphasis ratings for each knowledge area. The emphasis scale was used to evaluate the appropriateness of the inclusion of each knowledge area. Below is the rating scale used on the survey questionnaire.

| | |
|-----------------|---------------------------------------------------------------------------------------------------|
| Emphasis | To what degree is each knowledge area emphasized in your curriculum of basic veterinary sciences? |
| | 0 - Not Emphasized at All |
| | 1 - Minimally Emphasized |
| | 2 - Somewhat Emphasized |
| | 3 - Moderately Emphasized |
| | 4 - Very Emphasized |
| | 5 - Critically Emphasized |

The live survey was sent by the AAVSB using a link to an online survey software. The survey opened on November 5, 2019 and closed on December 15, 2019. The target survey population consisted of academic deans of AVMA COE-accredited veterinary schools and others who are involved in the development of the school veterinary curricula. During that period a total of 128 respondents clicked on the survey link to begin the survey, yielding a usable number of 58 responses with a valid response rate of 45.31%.

Development of Exam Specifications

The content analysis study committee met during an online conference call/webinar on January 15, 2020 to review the results of the survey, finalize the knowledge topics that would comprise the next Examination Content Outline, and decide the content weighting for the examination.

The committee reviewed the demographic results and confirmed that the results matched expectations and impressions of the practitioner population, suggesting that the respondent sample is reflective of the veterinary sciences educators of AVMA COE-accredited veterinary medicine college programs.

With guidance by PSI, the committee set baseline statistical standards for percent emphasis and mean emphasis ratings that each knowledge area would have to satisfy in order to be included in the list of knowledge areas.

The statistical criteria that a knowledge area had to satisfy were:

- percent emphasis: greater than or equal to 80%.
- mean emphasis ratings: greater than or equal to 2 ("Somewhat Emphasized")

All of the knowledge areas were retained by the committee. No wording changes were made to any of the knowledge areas either.

The committee then reviewed content weightings and discussed any adjustments necessary to align the number of items per content area for adequate content coverage on the examinations. The content weightings were calculated based on survey ratings by determining a percentage weight based on the relative mean emphasis rating for each content area. The committee compared the survey-rating-based content weightings with the average percentage of credit hours that veterinary medicine college programs dedicated to relevant subjects in the first three years of veterinary sciences education. The resultant exam content weighting was considered realistic and appropriate for the exam development work such as writing items and supporting item content with available professionally-acknowledged references.

Appendix A - Subject Matter Experts

Content Analysis Study Committee (*PAVE Committee Members 2019 and/or 2020)

| NAME | RELEVANT CREDENTIALS | YEARS OF EXPERIENCE | EMPLOYER/ AFFILIATION | JOB TITLE | GEOGRAPHIC LOCATION |
|-------------------------------------------|---------------------------|---------------------|----------------------------------------------------------|------------------------------------------------------------------|---------------------|
| *Anne Duffy (PAVE Committee Chair) | RVT | 43 | Kirkwood Community College – retired | Professor, Former Veterinary Technology Program Director | IA |
| *Robert Bill | DVM, MS, PhD, | 37 | Purdue University - retired | Asst. Dean for Academic Affairs, Teaching, & Learning | IN |
| *Janie Carpenter | DVM | 34 | Private Practice | Veterinarian | TX |
| *Liane Nelson | DVM | 16 | Oulton College; Private Practice | Veterinary Technology Education Advisor and Program Veterinarian | Canada |
| *Dale Paccamonti | DVM, MS, DACT | 38 | Louisiana State University | Professor | LA |
| *Aja Senestraro | DVM, CVA, CMTPT, CIVCA | 9 | Private Practice | Veterinarian | WA |
| *Neil Wiseley | DVM | 44 | Private Practice | Veterinarian | WI |
| Lara Maxwell | DVM, PhD, DACVCP | 28 | Oklahoma State University | Associate Professor | OK |
| Shelley Newman | DVM, DVSc, DACVP | 29 | Long Island University | Associate Dean of Academic and Student Affairs | NY |
| *David McKenzie | DVM, MS, MPH, PhD, DACVIM | 25 | Tuskegee University | Professor | AL |
| Katie Tyler | DVM | 9 | Murray State College; Private Practice | Veterinary Technology Program Veterinarian | OK |
| *Heidi Banse | DVM, PhD, DACVIM | 9 | Louisiana State University School of Veterinary Medicine | Faculty | LA |

Appendix B - Exam Content Outline

| | | |
|----------|--------------------------------------------------------------------------------------------------------|-------------|
| 1 | Normal Structure and Function | 24% |
| A | Gross Anatomy | |
| B | Physiology and Biochemistry | |
| C | Histology and Embryology | |
| D | Endocrinology | |
| E | Immunology | |
| F | Genetics and Breed Characteristics | |
| G | Animal Behavior (i.e., individual, herd) | |
| 2 | Concepts of Disease | 18% |
| A | General Pathology and Pathophysiology | |
| B | Microbiology (e.g., virology, bacteriology, mycology, etiological agent, etc.) | |
| C | Parasitology | |
| D | Toxicology | |
| 3 | Diagnostics | 23% |
| A | Clinical Pathology (e.g., clinical chemistry, hematology, diagnostic cytology, etc.) | |
| B | Anatomic Pathology (i.e., histopathology, necropsy) | |
| C | Diagnostic Imaging | |
| D | Examination (e.g., physical, neurological, etc.) | |
| E | Other Diagnostics (e.g., ECG, abdominocentesis, etc.) | |
| 4 | Therapeutic Intervention | 20% |
| A | Surgery | |
| B | Anesthesia and Analgesia | |
| C | Emergency and Critical Care | |
| D | Clinical Pharmacology and Therapeutics | |
| E | Basic Pharmacology (e.g., concepts, classifications, mechanisms, etc.) | |
| F | Behavioral Interventions | |
| 5 | Public Health and Disease Prevention | 11% |
| A | Zoonoses, Public Health, and Biosecurity | |
| B | Preventative Health Care | |
| C | Epidemiology | |
| D | Nutrition (e.g., diet, disease management, etc.) | |
| E | Regulatory Medicine (e.g., USDA, CFIA, etc.) | |
| 6 | Professional Skills | 4% |
| A | Human-Animal Bond (e.g., animal welfare, hospice care, euthanasia, etc.) | |
| B | Communication, Professionalism, Ethics, and Wellness | |
| C | Practice Management (e.g., record keeping, regulations, controlled substances, workplace safety, etc.) | |
| | Total | 100% |



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