IDENTIFICATION OF TASKS PERFORMED BY ANIMAL CARE TECHNICIANS AND VETERINARY ASSISTANTS IN MANITOBA

A Thesis

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In Partial Fulfillment of

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Master of Education

by

Loretta A. Williams

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ABSTRACT

Because of the increasing use of animals as subjects in biomedical and veterinary research, there is an expanding need for technicians who are trained in the skills and techniques required to support and complement the work of the animal research investigator, the Veterinarian, and individuals in related professional areas.

This study was designed to determine the opinions of professionals in the animal science area as to the need for such technical personnel, and to determine the tasks which these technicians perform in Manitoba. A comprehensive list of practising veterinarians, animal science educators and related biomedical research professionals in Manitoba was prepared. A Task Inventory of duties which might be performed by technicians in the veterinary, animal science and biomedical research areas was constructed, and together with other pertinent questions incorporated into two questionnaires. One questionnaire contained questions to be answered by veterinarians and the other questionnaire was designed to be answered by professionals in animal science and related areas. A total of one hundred and four questionnaires were mailed to the selected participants and eighty-one replies were received.

The responses to the questions on the questionnaire were analyzed and reported as percentages, together with any comments made by the respondents. The task statements were analyzed, and resulted in comparisons of the mean of each task statement as reported by the two groups of professionals. Based on the results obtained, a list of tasks in rank

order of importance was identified for animal science technicans and veterinary assistants. This list indicated that tasks in the areas of Animal Nursing and Surgical Assistance were of major importance to both groups of technicians. Tasks which were only of major importance for animal care technicians were Animal Breeding and Medicine, while the tasks which were of major importance for veterinary assistants were Radiography, Laboratory Procedures, Office Procedures and Sanitation.

An analysis of results revealed that in Manitoba the requirements are for technicians with a diversified training in the animal science area, and not for specially trained animal care technicians and veterinary assistants. If a training program for such animal science technicians was initiated, the following courses should be included: Animal Nursing; Surgical Assistance; Animal Breeding; Medicine; Radiology; Laboratory Procedures, Sanitation and Office Practices.

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TABLE OF CONTENTS

Chapter Page

APPENDIXES (Continued) Page

LIST OF TABLES

Chapter 1

Background to the study

Biomedical and veterinary medical research in governmental, private and commercial laboratories, has created an expanding requirement for the services of technically trained paraprofessional personnel. With the increasing development of highly sensitive instrumentation, clinical and surgical techniques, the biomedical researcher, the veterinary practioner and other professionals in areas related to animal science have become increasingly dependent upon the services of qualified technicians to work as support personnel. Therefore an increasing requirement for individuals to work in technical positions as Veterinary Assistants, Animal Care Technicians and as assistants in related animal science areas is evident.

Technicians in the animal science area have been available from two sources. One source is untrained high school graduates and other individuals who through observation and work experience are trained on-the-job. A second source is graduates from Biological science and Medical laboratory technician training programs. These persons have skills in areas which are related to animal technician positions, but do not have specific training to work with animals. These technicians therefore require varying amounts of on-the-job training.

STATEMENT OF THE PROBLEM

This study was designed to determine the opinions of professionals in the animal science area and of practising veterinarians as to the need for animal care technicians and veterinary assistants, and the tasks that such technicians perform in Manitoba. The study also compared the differences in opinions expressed, and from these opinions, the content areas which should be included in a training program for such technicians.

Specifically, this study was designed to answer the following question and hypotheses:

1. What are the opinions of practising veterinarians and professionals in animal science, as to the need for qualified veterinary assistants and animal care technicians in Manitoba?
    a. What are the different types of tasks performed by veterinary assistants and animal care technicians in Manitoba as reported by professionals in these areas?
    b. Are there differences in the tasks identified by the two groups of professionals?
    c. What are the initial salaries and promotional opportunities for qualified veterinary assistants and animal care technicians?

Hypotheses tested. To assist in answering the question the

following hypotheses were tested.

1. There are no significant differences in responses of Metro Winnipeg veterinarians and veterinarians in practice outside Metro Winnipeg based on the means of each task statement.
2. Animal care professionals and veterinarians differ in their opinions as to the importance of the tasks performed by technicians who work in their areas, since these two groups of professionals are occupationally different.

PURPOSE OF THE STUDY

In Manitoba there are a variety of positions in which animal science technicians are employed. Such positions include biomedical animal research; animal science teaching support; veterinary assistance; laboratory animal care; laboratory diagnostic procedures and in agricultural areas. There is no indication that studies to determine job availability or the feasibility of introducing special technician training programs in the animal science area are currently being conducted in Manitoba. It is of practical importance to conduct such a study at this time.

Tasks performed by technicians in the animal science and veterinary areas will vary with the positions in which such technicians are employed. An analysis of the tasks performed by these technicians is therefore necessary. Such an analysis will establish the goals of each task in the areas employed. Professionals who work in the animal science area and veterinarians have the required

expertise and necessary experience to determine the particular training requirements of technical personnel in their areas.

The results of this survey indicated the type of qualifications for technicians trained in the animal science area in Manitoba by presenting a list of duties important to animal care technicians and veterinary assistants. This study also determined the suggested starting salaries and methods of job advancement for these technicians, information which is potentially useful for both the professionals and technicians. It also resulted in recommendations for subjects which should be included in a training program for such technicians.

Limitations

This survey was designed to give information on Manitoba. In provinces with larger populations the opportunities for employment in the animal science and veterinary areas and qualifications may differ to those identified for persons in Manitoba.

DEFINITION OF OCCUPATIONAL AREA

Animal science technicians may be employed by any of a cluster of positions allied with the biomedical and veterinary fields as assistants to medical, veterinary or related professional areas. The following section is an outline of general duty areas of animal care technicians, veterinary assistants and employment areas which are occupationally similar to these groups.

Animal Care Technician

The tasks performed by such technicians will vary with the

establishment or animal facility. These technicians may breed, raise, care for, and handle biological research animals and assist in the care and treatment of pets and other animals in animal hospitals. Such technicians may be involved in: monitoring and reporting on experiments in which animals are used; testing the effects, i.e. tolerance and toxicity, of various pharmaceutical products on animals; maintaining laboratory animals and supervising animal caretakers; breeding disease free animals, and keeping accurate records of breeding crosses.

Veterinary Assistant

This technician may work in a small or large animal facility under the supervision of a practising veterinarian. The duties may include maintenance of admission records; administration and application of certain medicines; application or changing of wound dressings; competence in handling, caring and testing animals. The assistant may also assist a veterinarian in preparing and sterilizing instruments for surgery; preparation of an animal during surgery, taking and developing x-rays. Such personnel may be called Veterinary Aids, Veterinary Laboratory Technicians, Veterinary Attendants or Animal Health Assistants.

Related Employment Areas

Most pharmaceutical manufacturers use laboratory animals for the testing of new drugs and chemicals. Technicians may be in charge of maintaining and breeding laboratory animal colonies, conducting

experiments on animals, and observing, keeping records and reporting on drug action on these animals.

Medical schools and research centres employ technicians in a variety of jobs, including performing general laboratory tests, supervising animal care facilities and maintaining animal breeding records. In the area of microbiological research, technicians may be required to inject various agents into animals, to observe and record the animals' reactions, and to analyze body fluids. Other technical duties include performing necropsy dissections, and saving relevant material for more detailed analysis by the professional. Hematological procedures such as collecting, preserving and performing complete analysis of blood samples may be among other duties performed.

Some research centres are involved in cancer research. Technical positions include breeding tumor-resistant or susceptible strains of animals, and maintaining accurate breeding, and research records.

Animal production centres may employ technicians in breeding, selling and shipping experimental animals to research establishments, schools and colleges.

Animal science and zoology departments of colleges and universities employ technicians as animal care personnel or teaching assistants.

Other positions work in agricultural areas and in diagnostic laboratory work.

All technicians must have good communication skills. These

skills include the ability to record, analyze, interpret and record technical data; and to understand technical information from such references as professional and scientific journals, operation manuals, and handbooks.

OVERVIEW OF THE RESEARCH PROCEDURE

A list of the tasks which might be performed by technicians in the animal science, biomedical research and veterinary areas was prepared and verified. This list, together with questions designed to determine the opinions of professionals in these areas, was incorporated into two questionnaires. One questionnaire was to be answered by the professionals in the animal science and biomedical research areas and the other questionnaire to be answered by practising veterinarians. The results from the questionnaires were analyzed. Determinations as to the need for qualified technicians in the animal science and veterinary areas, the tasks that such technicians might perform and recommendations as to subjects which might be included in a program to train these technicians were made as a result of the analysis.

ORGANIZATION OF THE THESIS

The thesis is divided into the following chapters:

An Introduction, which includes the purpose of the study, general objectives, a definition of the occupational area and an overview of the research procedure.

A review of some similar studies which have been done in the United States and their general methods and conclusions. Some examples of relevant programs which train Animal Care Technicians and Veterinary Assistants are included in this section.

The next section is an explanation of the development and validation of the questionnaire, and the methods used in collecting and analyzing the responses.

The results of the survey are next reported. These results analyze the responses of professionals in the animal science area and veterinarians and compare the differences in responses to the Task Statements by the two groups. An importance value was determined for each task statement, and these values were listed in order of importance as determined by each professional group.

Conclusions as to the need for animal care technicians and veterinary assistants, their training requirements, salaries and promotional opportunities are made from the results of the survey. Subjects which should be included in a training program are recommended.

Recommendations as to need for further research into technical positions available in other areas of the Life Sciences, and their training requirements are made.

Chapter 2

REVIEW OF THE LITERATURE

A review of literature relating to technicians in the animal science and veterinary areas was necessary in order to gain information on existing practices and programs in which such technicians are trained.

Brandt et al., (n.d.) reported on a two year Program in Animal Science Technology at Delhi College in New York, U.S.A. This program was designed to reflect the increasing demand for qualified personnel in the animal science area. In the development of the curriculum an effort was made to be responsive to the professional implications and employment potential which exists for technical support personnel in biomedical research and veterinary fields.

In this study questionnaires were mailed to professionals in biomedical research, related professional areas, veterinarians and graduates of animal science technology courses in Delhi, New York. These questionnaires asked about: the relative importance of each of the major content and skills areas of the course as related to specific job titles, the effectiveness of teaching aids and instructional methods, and the optimum format for a two year degree program in Animal Science Technology.

This study by Brandt et al., did not comment on the differences in responses to the task statements by the different groups of professionals, but the following conclusions were made as a result of the study: the general abilities which received highest ratings are the ability to keep

adequate records, follow directions and to accept and carry out responsibility. The specific skills areas which received highest ratings are a knowledge of definitions, descriptive terms and other language of the field of animal science, microscopic and gross anatomy and an ability to perform laboratory testing procedures. Teaching methods and instructional aids were regarded as adequate or better by an average of sixty-six percent of the respondents.

A majority of respondents indicated that employment advancement for technicians took the form of increased salary together with more job responsibility. Salary increase alone was reported as a means of advancement by fourteen percent of the respondents, while six percent of the respondents indicated that employment advancement was in the form of another job title with no accompanying increase in salary.

Brandt et al., recommended the format for a program to train qualified technicians in the animal science area. The animal science curriculum was divided into two major options which were Laboratory Animal Technology and Veterinary Assistant Technology. Students may specialize in one option and with permission, elect to take courses in the alternate one.

The Laboratory Animal Technology option is directed towards functioning in both technical and supervisory positions in areas of biomedical research and laboratory animal breeding. In addition to the establishment of a basic background in the fundamentals and practices associated with the maintenance, housing, husbandry and breeding of laboratory animals, instruction is also provided in specialized areas of technology relating to this option. Such areas include laboratory animal vivarium management, gnotobiotic (germfree) techniques, and

selected animal experimental processes utilized in biomedical research. Clinical diagnostic laboratory procedures include microbiological, urinalysis, hematological, histological, radiological techniques.

The graduates of the Veterinary Assisting Technology Option would be employed in animal hospitals to give assistance and support to practising veterinarians. The graduate is qualified to relieve the veterinarian of routine duties, such as nursing care, surgical preparation, laboratory testing, and office procedure. Other routine competencies include clinical diagnostic laboratory procedures, supervision of subordinate hospital personnel and operation of x-ray equipment. The curriculum in this option emphasizes the importance of veterinary medical ethics as it relates to their profession. It is noted that both options include competency in clinical diagnostic laboratory procedures in the training program.

Cooke et al., in 1975 conducted a study designed to determine "Tasks Essential to Successful Performance as an Animal Health Technician." The specific objectives of the survey were to develop and validate an initial task inventory; identify specific tasks performed, and determine the relative importance of the specific tasks to be performed by the animal health assistant.

A task inventory of duties performed by Animal Health Technicians was developed by consulting existing task lists, job descriptions and curriculum guides. This inventory was incorporated into two questionnaires, one designed to be answered by Veterinary employers of Animal Health Technicians, and the other questionnaire to be answered by Animal Health Technicians employed in the veterinary practice. A sample of one hundred veterinarians operating small animal care hospitals was selected from the 1975 directory of the Ohio Veterinary Medical Association. The

veterinarian was instructed to complete an employer questionnaire and to have a responsible animal health assistant complete the employee questionnaire.

Fifty-four percent of the questionnaires were completed and returned, but only forty-four percent of those returned were usable. The relative frequencies, means and ranking for each task statement were reported.

A level of importance rating was determined for each task, an importance value of 2.0 was established as the minimum required level of competence for each task. Duty areas of work which received a value of 2.0 or higher importance rating as determined by both Veterinarians and Animal Health Assistants are listed below.

1. Performing General Office Work
2. Recording Information
3. Handling and Caring for Animals
4. Feeding Animals
5. Grooming Animals
6. Performing Examining Room Work
7. Performing Laboratory Tests
8. Dispensing Medicine and Supplies
9. Administering Medication
10. Assisting in Restraining Animals
11. Assisting with X-rays
12. Using and Maintaining Surgical Equipment and Small Animal Care Equipment
13. Preparing Facilities and Equipment for Surgery
14. Preparing Animals for Surgery
15. Performing Emergency First Aid
16. Inventorying Products

17. Maintaining Facilities

18. Following Safety Precautions.

Recommendations from this survey were that educators and others who are developing educational programs examine the results for each specific task to determine curriculum content for preparing animal health assistants. Specific tasks with a high level of performance and importance rating should be given more emphasis in the educational program than specific tasks with a low level of importance and performance rating.

In 1975, the United States of America, Government Printing Office, issued a publication entitled "Veterinary Science Technology: A Suggested Two-Year Post High School Curriculum." This publication was designed to assist individual states of the United States in planning and developing programs in Veterinary Science Technology. This report is divided into three sections. Section I provides general information on occupational opportunities, abilities required by such technicians, textbooks, references and instructional media. Section II contains curriculum outlines of Veterinary Science Technology, Meat Inspection and Regulatory Technology. It also emphasizes that graduates must be productive at the job entry level, and that there must be a reasonable amount of work experience included. No references were made as to salaries or promotional opportunities for these technicians. Section III consists of outlines of the following subjects: Animal Diseases; Animal Hospital Procedures; Animal Management; Applied Meat and Poultry Inspection; Animal Hospital Procedures and Management; Applied Meat and Poultry Inspection; Applied Microbiology; Clinical Techniques; Comparative Anatomy and Physiology; Laboratory Animal Methods; Laboratory Techniques; Applied Chemistry; Mathematics and Communications. The concluding section includes general

planning, laboratory facilities and equipment required, cost estimate, a bibliography, and a list of scientific, trade and technical societies concerned with Veterinary Science Technology.

Animal Science Technology Courses in other areas in Canada

There are programs in Canada in which technicians are trained to become qualified animal care technicians and veterinary assistants. Examples of such programs are included in the following section.

The Southern Alberta Institute of Technology (SAIT) offers a program in Animal Health Technology, which is conducted over two academic years. The course is divided into two phases. During the six month time period, of "Phase I" students are exposed to detailed studies in the laboratory aspects of veterinary clinics. "Phase II" is under direct supervision of a veterinarian and is spent at Olds College. Duties include providing technical assistance, performing tests with accuracy and carrying out other routine clinical duties under the guidance of the veterinarian.

The Northern Alberta Institute of Technology offers a program in Veterinary and Animal Science Technology. It provides training in the general care and management of animals, so that a graduate may competently assist practising veterinarians or scientists in biomedical research. Graduates are expected to obtain positions as assistants in veterinary clinics, in the animal units of federal and provincial research institutions, in pharmaceutical concerns, in zoos, and in commercial concerns of laboratory animal breeders. Students are given practical training at

Vermilion College in the care and management of large animals.

The Kelsey Institute of Applied Arts and Sciences, Saskatoon offers a two year Biological Sciences Technology Program which includes an Animal Health option described in its calendar (1976-78) as follows:

> The biological science subjects, generally divided into the areas of plant, animal and microbial study, include basic theoretical classes and more advanced technique oriented classes. Of extreme importance are the related subjects, communications, mathematics, physics, photography and chemistry which make up 40% of the instruction time and often determine the effectiveness and versatility of a technologist. Throughout the program emphasis is placed on competency in the laboratory skills and techniques.

The Animal Health option is offered in the fourth semester at the Western College of Veterinary Medicine, Saskatoon. The subject areas are:

Anatomy	Necropsy
Clinical Pathology	Small Animal Surgery
Reception Area	Large Animal Surgery
Pharmacy and Medical Records	Anesthesia
Radiology	Small Animal Medicine
Field Service	Large Animal Medicine

The St. Clair College of Applied Arts and Technology in Windsor, offers a two year Animal Health Technician Program. The stated purpose of this program is to provide paramedical personnel for veterinary hospitals. The program is accredited by the Ontario Veterinary Association. The calendar lists the following courses:

Major courses

Mammalian Biology	Clinical Pathology (Body Fluids)
Animal Nutrition	Applied Microbiology (Infectious Diseases)
Clinical Orientation	Clinical Experience 1
Orientation to Animal Health	Animal Hospital Technique Seminars
Animal Anatomy & Physiology	Radiography 2
Radiography 1	Animal Nursing 2
Principles of Humane Animal Care	Histo Techniques & Sample Preparation
Animal Handling	Clinical Experience 2
Parasite Identification	
Animal Nursing 1	

Principles of Disease (Non Infectious)	Animal Production & Feeding
Clinical Pathology	Laboratory Animal Care

Related courses

Records Management	Pharmaceutical Mathematics
Genetics and Heredity	Communication and Business
Introductory Microbiology	Practices

The teaching facilities include a small-animal holding facility licensed by the Animals for Research Act, Ontario.

Sheridan College in Oakville, conducts an Animal Care Program. This is designed for those who wish to care for companion and research animals in humane societies, veterinary hospitals, pet shops and research establishments. Students have access to the college's animal care centre, and one day per week is spent at off-campus cooperating agencies. No other imformation on the program is available from the Sheridan College Program Descriptions.

There are no programs in Manitoba which specifically train animal care technicians and, or veterinary assistants.

The literature search revealed a few pertinent studies which were conducted in the United States of America relating to the training of technicians in the animal science and veterinary areas. There are programs in Canada in which technicians are trained to become qualified animal care technicians and veterinary assistants, but no records of research to determine their training requirements were found.

Chapter 3

RESEARCH PROCEDURES

The following section is an outline of the research procedures which have been followed in order to obtain the answers to the questions posed. A list of practising veterinarians, animal science professionals and biomedical researchers was prepared and a sample selected. A task inventory of duties was compiled and included with other relevant questionnaires. The professionals were asked to respond to the questionnaires, and an analysis of the responses was made.

SELECTION OF SAMPLE

The facilities in the animal science area which were included in the survey were obtained through the author's personal knowledge of the relevant institutions and recommendations from professionals in this area. A comprehensive list of these facilities was prepared. Representatives from each institution were contacted by telephone and asked to suggest the names of professionals who might be included in the survey. The final mailing list of professionals in the animal science area was compiled as a result. (See Table I).

A list of veterinarians who were members of the Manitoba Veterinary Medical Association was obtained. This list contained the names, type of practices and locations of one hundred and ten veterinarians who were practising in Manitoba. One veterinarian from each practice was selected to be a participant in the survey, by selecting the first

name appearing on the list of veterinarians from each practice.

The thirty individuals who were selected as survey participants from the animal science area were placed in Category I. The fifteen veterinarians selected from practices in Metro Winnipeg were placed in Category II and the fifty-nine veterinarians, from practices located outside Metro Winnipeg were placed in Category III.

Table I indicates the professional areas, location and number of participants from each location which were surveyed.

Table I

SURVEY SAMPLE

Professional Areas	Location	Number
Animal Science Area		
Animal Science Teaching	Red River Community College	
	Biological Technology	1
	University of Brandon	
	Department of Zoology	1
	University of Manitoba	
	Department of Animal Science	5
	Department of Biology	1
	Department of Foods and Nutrition*	1
	Department of Oral Biology*	1
	Department of Pharmacology*	1
	Department of Psychology*	1
	Department of Zoology	7
	University of Winnipeg	
	Department of Biology	1
Biomedical Animal Research	Manitoba Cancer Foundation	3
Laboratory Animal Care	University of Manitoba	
	Medical College - Animal Care Unit*	1
	Department of Zoology	1
Agricultural and Diagnostic Laboratory	Government of Canada	
	Agriculture Canada - Animal Pathology Laboratory	1
	Government of Manitoba	
	Agricultural Services Complex - Veterinary Laboratory	3
Laboratory Supply	Ayerst Laboratories	1
Veterinary Area		
Veterinarians in Practice	Metro Winnipeg	15
	Outside Metro Winnipeg	59

*Indicates areas of Animal Science teaching also involved in Biomedical Animal Research.

DEVELOPMENT OF THE QUESTIONNAIRE

Task Inventory

Duty areas and task statements for jobs performed by animal care technicians and veterinary assistants were prepared. These duties and task statements were identified by searching relevant job descriptions, curriculum guides, community college program calendars and reference publications entitled "Encyclopedia of Careers and Vocational Guidance, Volume II, Careers and Occupations" and "Canadian Classifications Dictionary of Occupations 1971, Volume I, Classification and Definitions."

Relevant tasks were grouped into one list and task designated as a "Task Statement." Each task statement was reviewed for clarity and consistency, and then incorporated with other pertinent questions into two questionnaires.

1. Questionnaire A. Animal Science Personnel Survey: To Deteriine Tasks Performed by Technicians In Animal Care in Manitoba.
2. Questionnaire B. Veterinarians In Small and/or Large Animal Practice Survey: To Determine Opinions of Practising Veterinarians And To Identify Tasks To Be Performed by Technicians.

Questionnaire Validation

The questionnaires were reviewed by a veterinarian, an instructor of small animal care, an individual who was skilled in questionnaire construction, and the members of the author's Faculty of Education Advisory Committee at the University of Manitoba.

They were asked to respond to the questionnaire by performing the following activities:

1. To indicate whether they considered any of the questions or task statements inappropriate.
2. To suggest additions to the questions or task statements which could be incorporated into the questionnaire.
3. To suggest changes in the wording of questions or task statements which could help add clarity to the questionnaire.

This procedure was designed to increase content validity. It was recommended that the number of items in the survey be kept to the minimum number which would be required to realize the objectives, and that an explanation of the reasons why certain questions were asked. The resulting suggestions were incorporated into the questionnaire.

DATA COLLECTION

One hundred and four questionnaires were prepared. These questionnaires were numbered and divided into three categories. The categories were:

Category I. Questionnaire A: to animal science personnel (Appendix III)

Category II. Questionnaire B: to veterinarians in private in Metro Winnipeg (Appendix IV)

Category III. Questionnaire B: to veterinarians in private practice outside Metro Winnipeg (Appendix IV).

A number was assigned to each participant. The questionnaire package

consisting of a covering letter which explained the objectives of the survey; one questionnaire form A or B, and a stamped self addressed return envelope, was mailed in the second week of December 1976. (For covering letter refer to Appendix I.)

A follow-up of nonrespondents was made in the first week of January 1977. All nonrespondents in Metro Winnipeg were contacted by telephone and were asked to mail in their responses. A questionnaire package consisting of: a letter requesting a response to the questionnaire (Appendix IV); the original cover letter (Appendix I) and questionnaire A or X, according to the original number assigned, was mailed to all nonrespondents in the survey.

DATA ANALYSIS

Analysis of Questions

An item analysis of each question asked on the questionnaire forms was performed. The responses to each were analyzed and the results reported as percentage responses. A 'summary of responses' follows each question, together with any comments made by respondents to that specific question. Each respondent was asked to make generalized comments on the space provided at the end of the questionnaire form. These generalized comments are reported in the section entitled 'Additional Comments to Questionnaire'. An analysis of the task statements is then reported.

Analysis of Task Statements

The coded answers from the responses to the task statements were keypunched onto IBM cards for computer analysis. The data were analyzed

using the Statistical Package for the Social Sciences. The program utilized was the Comparison of Sample Means, Independent Samples, Population with Unequal Variances. This resulted in the computation of the relative and adjusted frequency, mean, standard deviation and variance for each task statement.

The responses were also analyzed to compare the differences in the opinions expressed by the groups in the survey by a comparison of the differences in the means of each task statement as determined by the three groups. The comparisons made were between the following groups: Comparison No. 1, Metro Winnipeg veterinarians (Group 2) and veterinarians outside Metro Winnipeg (Group 3), and Comparison No. 2 - animal science personnel (Group 1) and all veterinarians (Groups 2 and 3). These analyses resulted in the computation of means, standard deviations, t values, F values and variance estimates. The .05 level of significance was used to evaluate the relevant ratios.

Use of t and F Tests. The t test is a comparison of the means of two groups. If the sample means are far apart the t test yields a significant difference. This permits a conclusion that the two populations do not have the same mean. The assumption is that scores in one group have the same degree of variability as scores in the second group. If the two groups do not contain the same number of scores, a check must be made on the data to support the assumption of homogeneous variances. The F test is a test for homogeniety of variance. If the F test shows a significant difference between the means, then the null hypothesis is rejected. If the F test shows no significant difference the researcher reports the results of the t test.

Hypotheses Tested. The following hypotheses were tested at the .05 level of significance. Symbolically:

$H_o: u_1 = u_2$

$H_1: u_1 \neq u_2$ for each task statement

There are no significant differences in responses in the means of each task statement between the groups.

u_1 = mean value for each task statement as determined by veterinarians in practice in Metro Winnipeg,

u_2 = mean value for each task statement as determined by veterinarians in practices located outside Metro Winnipeg.

Symbolically:

$H_o: u_1 = u_1'$

$H_1: u_1 \neq u_1'$ for each task statement

There are no significant differences in responses in the means of each task statement by the two groups.

u_1 = mean value for each task statement as determined by animal science professionals.

u_1' = mean value for each task statement as determined by veterinarians.

Chapter 4

RESULTS

Response to the Survey

One hundred and four questionnaires were mailed, and eighty-one replies were received. This response represents a seventy-eight percent return. Table II summarizes the response to the questionnaire.

Table II

RESPONSE TO QUESTIONNAIRE

Response Group	Number Mailed	Number Returned		Percent
Category I				
Animal Science Area	30	Usable returns	23	80
		Unusable returns	1	
Non respondents			6	
Veterinarians				
Category 2				
In Metro Winnipeg	15	Usable returns	8	
Category 3				
Outside Metro Winnipeg	59	Usable returns	42	77
		Unusable returns	7	
Non respondents			17	
Total mailed	104	Total returns	81	78.5

Analysis of Unusable Returns and Non-response to the Questionnaires

Animal Science Personnel. Unusable return: This return was from a Biological Supply Laboratory in Winnipeg, which explained that the branch was only a

distribution centre for products and did not employ technicians.

Non respondents: One reply from the Manitoba Cancer Research Foundation was not received and was presumably lost in the mail. Another questionnaire was mailed to this participant in the follow-up but no reply was received.

The other non respondents were from the Department of Zoology, University of Manitoba, however replies from other participants from this facility were received.

Practising Veterinarians. Unusable returns: There are six respondents who did not respond to the Task Statements but did reply to the questions. Another questionnaire was returned unanswered with the following comment:

> "The Veterinarian should do the scientific, academic work and the technical labor should be done by technicians, (in) the same way as human hospitals are organized. We need an organized economy and the veterinary service to have its place."

Non respondents: These individuals did not respond although follow-up questionnaires were mailed.

ANALYSIS OF RESPONSES

Animal Science Area - Questionnaire A

Question a. In which of the following type of facility are you employed? Please check one of the following.

	Category	Percent
1.	Biomedical Research	26
2.	Animal Science Instruction	35
3.	Animal Care and/or Breeding	26
4.	Federal Government Regulatory Laboratory	4
5.	Provincial Government Laboratory	9

Summary of Responses. The major group of respondents were in Animal Science Instruction. These University and Community College Animal Science, Zoology and Biology departments.

Question b. What is the job title of technical employees in your establishment?

		Percent
1.	Animal Laboratory Technician	20
2.	General Laboratory Technician	40
3.	Veterinary Assistant	0
4.	Animal Care Technician	30
5.	Biomedical Technician	0
6.	Teaching Assistant	3.3
7.	Animal Inspector	3.3
8.	Resource Technician	3.3
9.	Other; Animal Health Technician, Animal Attendant, Bacteriology Technician, Animal Technician, Laboratory Student Supervisor	

Summary of Responses. Job titles for technicians vary. Although a number of technicians work in the biomedical area, they were not described as Biomedical Technicians, but usually as General Laboratory Technicians.

Question c. If you do not now employ such technicians what is the reason?

		Percent
1.	There are no qualified technicians to fill your requirements	8
2.	The facility in which you are employed is too small.	4
3.	Such technicians, although not now employed, will be hired in the future.	0

		Percent
4.	Such technicians are not required in this establishment	4
5.	Other (Please specify).	0

Summary of Responses. Respondents in Veterinary microbiology and cancer research indicated that there were no qualified technicians to fill their requirements.

Comments. One respondent indicated that there is "lack of funding for adequate staffing" in a number of facilities, therefore technical staff is kept to a minimum.

Question e. Technicians, currently employed in your facility have the following educational qualification:

		Percent
1.	University Science degree	45.5
2.	Graduate of a Community College or Institute of Technology Science technicians course	37.5
3.	High school graduate	4.0
4.	Other; Canadian Association of Laboratory Science Technicians (C.A.L.A.S.)	17.0

Summary of Responses. The results indicate that at present there are more University Science graduates employed in technical positions than Community College or Institute of Technology Science graduates.

Question f. The present starting salary on a monthly basis is:

		Percent
1.	$500 - 600	13.5
2.	$601 - 700	18.0

		Percent
3.	$701 - 800	41.0
4.	$801 - 900	23.0
5.	$901 - 1,000	1.0
6.	Other	0.0

Summary of Responses. Since the educational level in such establishments varied from university to high school graduates, salary ranges would also vary. University graduates salaries were not always higher than those of community college graduates.

Question g. In which of the following ways are such technicians compensated for good job performance?

		Percent
1.	Given more responsibilities only	3.0
2.	Given another job with more responsibility but no salary increase	0.0
3.	More responsibility and increased salary	34.0
4.	Annual increments	43.0
5.	By successful completion of courses in the area of work, from college, university, seminar or inservice training.	8.5
6.	No promotion opportunities exist	11.5

Summary of Responses. Good job performance is compensated by annual increments, usually negotiated by union contracts. This was indicated in the majority of cases.

Areas where no promotion opportunities exist included some positions as laboratory assistant in university zoology departments and

animal housing facilities. Salaries would increase, but job classifications would remain the same.

Additional Comments. The following are comments from questionnaire respondents. Technicians should have:

1. "competency in almost all the tasks listed. Supply of technicians may outnumber demand."
2. "a moderate knowledge of veterinary microbiology - verterinary infectious disease."
3. knowledge of "experimental data collecting and summarizing"
4. have responsibility for "the day to day operation of animal holding and breeding areas"
5. competency in "collection of specific organs under sterile conditions for tissue culture, passage of tumors, mouse tail vein bleeding and injections; rabbit ear and heart blooding."

However, one respondent stated that, "the questionnaire does not apply well to the technical staff we employ. Many technicians and all teaching assistants require a university degree. Animal care technicians are usually trained in the department and take instructions through the Extension Division of the university."

Veterinarians in Small and/or Large Animal Practice - Questionnaire B

Question a. What type of Veterinary Practice do you now maintain?

		Percent
1.	Small Animal Practice	17
2.	Large Animal Practice	0
3.	Mixed	80
4.	Other (please specify) Equine	2

Summary of Responses. Among respondents from Metro Winnipeg, 80% were in small animal practice, while those located outside Metro Winnipeg operated mixed practices with approximately 75% being large animal care.

Question b. What is the job title of technical personnel in your practice? Please check one.

		Percent
1.	Animal Laboratory Technician	0
2.	General Laboratory Technician	0
3.	Veterinary Assistant	4
4.	Animal Care Technician	2
5.	Laboratory Assistant	0
6.	Other; Receptionist, Bookkeeper, Secretary	0

Summary of Responses. Fifty percent of Metro Winnipeg respondents employed veterinary assistants while only twenty-three percent of those located outside the city employed such personnel.

Comments. In all cases it was noted that such assistants must be capable of performing other non-technical job functions. These include jobs such as receptionist, bookkeeper, office manager and clinic attendant.

In some mixed practices, with a high volume of large animal work, a "man to assist in controlling such animals" may be employed.

Question c. If you do not now employ such technicians what is your reason?

		Percent
1.	There are no qualified technicians to perform the tasks you require	5
2.	Such technicians are not required in your facility.	65

		Percent
3.	If such technicians are trained they will be hired at your facility.	10
4.	Other	20

Summary of Responses. Veterinarians who responded to this question indicated in 65% of responses that technicians were not required by their facilities. Only 10% of those reponding expressed a willingness to hire qualified technicians in the future.

Comments. The following comments were expressed in response to this question.

1. "a secretary assistant - we feel is all we require for our facility"
2. "workload not large enough to warrant hiring a technician - at present"
3. "business finances somewhat short and not enough volume of work."
4. It is better to "train lay staff at salary, $6,000 - $7,000. Qualified people are trained outside the province, Saskatchewan, Alberta, Ontario."
5. " "There are technicians - I may employ one in the future."

Question e. The Veterinary Laboratory, at the Agricultural Services Comllex in Fort Garry, currently performs laboratory tests, free of charge, to practising veterinarians. If a full cost recovery service fee is initiated which of the following options would you choose?

		Percent
1.	Continue to use the services of the Veterinary Laboratory	47.0
2.	Perform certain tests on your own in your facility	24.5
3.	Employ a qualified Veterinary Assistant, if available.	21.0

		Percent
4.	Would train an unqualified individual in your own facility	7.5

Summary of Responses. A majority of veterinarians would continue to use the services of the veterinary laboratory.

Only 21% would employ a qualified veterinary assistant. Their job functions would also include animal care, reception, clerical and janitorial duties.

Question f. If, instead a token service fee is charged, which options from question e. would you select?

		Percent
1.	Continue to use the services of the Veterinary Laboratory	71
2.	Perform such tests on your own in your facility	17
3.	Employ a qualified Veterinary Assistant, if available	12
4.	Would train an unqualified individual in your own facility	0
5.	Other (please specify)	0

Summary of Responses. Seventy-one percent indicated that they would continue to use the services of the veterinary laboratory.

Comments. Some veterinarians who would not employ qualified veterinary assistants commented that as a result they would:

1. "be more selective in utilizing the services of the Veterinary Laboratory, at Agricultural Services Complex"
2. "utilize the laboratory on a more practice service cost basis, i.e. - something the client will agree to pay for"
3. "occasionally perform tests in my own facility, and use hospital"

4. one such practitioner was still "undecided" about his future actions.

Question g. If you would continue to use the services of the Veterinary Laboratory, is the reason that:

		Percent
1.	Costs involved in employing such technicians would be too high.	23
2.	There are not enough duties to be performed by such an assistnat.	54
3.	High school graduates may be trained, at less cost, to satisfactorily perform in the areas that you require	16
4.	You would wait to get reports on the job performance of such technicians from other veterinarians.	7
5.	Other	

Comments. A majority of responses to this question indicated that there were not enough duties to be performed by such an assistant in their facilities. Some respondents noted that if another veterinarian were employed instead of a technician, costs involved would not be significantly higher.

Another respondent stated that "many duties cannot be performed in our clinic, by an assistant or otherwise. Histopathology, virus work, (virology) and immunology, can only be done by specialists in well equipped laboratories. In these instances, a facility, such as the Veterinary Laboratory, is required".

Question h. Which of the following types of institutions, do you think would be most appropriate for training such technicians in Manitoba?

		Percent
1.	University	10
2.	Community College	60
3.	Technical-Vocational High School	6
4.	Other	24

Summary of Responses. Most respondents indicated the community colleges would be the most appropriate type of training institution for such a program, while ten percent thought a university program would be most suitable.

Comments. Twenty-four percent of the respondents expressed other opinions, as quoted below:

1. technicians must have "on-the-job experience to appreciate animals, and all related materials"
2. technicians should have a"a combination of veterinary practice experience and community college"
3. "character must take precedence over choice of institution of training".

Question i. If such a training program is initiated would you be prepared to provide a field placement experience (internship) for such trainees. Please respond to one of the following: -

		Percent
1.	Yes, at any time	39
2.	Yes, as long as I could select the most convenient time period.	52
3.	No, I am usually too busy	9

Summary of Responses. Ninety-one percent of respondents are prepared to provide field experience for such trainees.

Comments. Among those who would not participate in such a program (9%) one respondent commented "this is a time consuming process and owners do not appreciate people using their animals as training subjects."

Question j. If you would agree to accept an 'intern' the most convenient time period for such an internship would be (please specify)

Summary of Responses	Percent
Anytime	19
January - June	44
Summer months	22
September - April	15

The most appropriate time period for such internship training is between January and June, since the majority of replies include these months.

Comments. Veterinarians who would participate in this program had the following comments.

1. "I am assuming that this period would be about six months" in duration.
2. "I would want them to be willing to help with whatever is available for us to do at this time of year."

Question k. The initial monthly estimated salary that you would consider to be appropriate for a technician would be:

		Percent
1.	$500 - 600	50
2.	$601 - 700	28
3.	$701 - 800	10

		Percent
4.	$801 - 900	0
5.	$901 - 1,000	12

Summary of Responses. A majority of veterinarians suggest that an initial monthly salary between $500 and $600 is most appropriate, while twenty-eight percent suggest a salary of between $601-700.

Comments. One respondent suggests that with an initial salary of $601 - 700 a technician should have a "rapid increase, depending on production efficiency".

Additional Comments.

1. "Economics would not permit the payment of $500 a month to such an employee, as that much business would not be generated, and free time for the veterinarian would not be increased. A technician cannot share weekend or night work. I would be more inclined to hire a secretary and train that person to do a few technical services.

   A technician should be able to earn about $9,000 per year but the market won't stand that right now.

   New veterinary graduates can be hired for $1,200 and provide new leisure time for the first veterinarian. Too many veterinarians are graduating and flooding market as it is.

   Many technicians are overtrained for the work they would be required to perform."

2. "We would require a technician to perform many more tasks than laboratory work. We presently employ one assistant. Her duties include reception and clerical work, all janitorial work including barn cleaning, animal restraint, handling and general care, and assisting the veterinarians whenever necessary. She is a high school graduate with no previous experience in this type of work. We would possibly employ a technician provided he or she would perform this wide range of tasks at the salary indicated - $500-600 per month. We would prefer to employ a graduate from the Kelsey Institute of Saskatoon, since these graduates have a sixteen week period in this course at

W.C.V.M in Saskatoon. Hence they are better trained to meet the variety of tasks encountered in a veterinary clinic."

3. "A technician must be properly trained prior to expecting salaries in excess of on job trained people."

4. "The concept of a trained technician is something that's hard to accept amongst older more established practices. The idea that 'no new graduate is going to tell me how to run my practice' still persists. Because the new veterinarians have had some experience in dealing with and in working in the training of veterinary technicians through veterinary lobbys, they are aware of their capabilities and I think are more willing to hire them upon graduation.

   Because few practices are large enough to hire technicians for specific duties an 'all round technician' is required. In our practice, our home trained technician is capable of performing duties, from cleaning feces from cages to surgical monitoring and radiology.

   The concept of a trained technician is a good one in my mind. unfortunately a lot of practices prefer to hire cheap high school help and suffer the pains and anxieties of turnover, training and retraining of personnel."

5. "There is no large animal practice in rural Manitoba. The farmers are doctoring their own animals, vaccinating them and performing minor surgery.

   The problem is not who shall train and what shall veterinary technical personnel do, but what to do to get veterinary work to veterinarians.

   In rural communities, the veterinarians perform major surgery, some horse practice, some small animal work and any left over which nobody wants to do."

6. "Rural practices are controlled by produce prices and rural practitioners cannot commit to any figure as their own income varies from year to year to large extents."

7. "The Clinics in the Provincial Clinic System are very new, slowly being equipped with laboratories, X-ray equipment and other facilities. A one-man practice cannot -- at present -- employ a technician, multiple-men practices will with a slow evolution in the future. One of the reasons why so few technicians are employed in mixed or large animal field, is the profession's low earning-power."

8. "The chances of employment are greater in a person with a diversified training."

9. "The whole question depends on whether the veterinary laboratory continues to provide the services as they do now. Any changes there will alter the whole picture."

10. "I would think it would be most important to have a uniform course and standards so that veterinary technicians could be accredited in some way.... I believe that veterinary technicians should have their own association, adopt their own standards, and system of accreditation."

11. "The veterinary technicians graduating from Saskatoon and Olds Community Colleges have very good training.... Still have trouble getting jobs and are generally underpaid when they do. Until veterinary technicians are better accepted, there doesn't seem to be much point in starting a similar course in Manitoba."

12. "With the large number of veterinarians graduating at present I see no necessity for technicians whatsoever.

ANALYSIS OF TASK STATEMENTS

Respondents were asked to rate each task as:

NA: item not applicable (code 0)

1: require slight competency in this task (code 1)

2: require moderate competency in this task (code 2)

3: require considerable competency in this task (code 3)

4: require complete competency in this task (code 4)

The code numbers which are stated above were used to determine a mean value for each task statement. The importance of each task statement as determined by the two groups of professionals (Animal Science personnel and Veterinarians) was determined by listing the means of each task statement in rank order. Refer to Table III.

Table III

RANK ORDER AND MEANS OF TASK STATEMENTS AS LISTED BY ANIMAL SCIENCE PERSONNEL AND VETERINARIANS

Task Statement	Importance Rank			
	Animal Science Personnel		Veterinarians	
	Rank Order	Mean	Rank Order	Mean
Cares for animals e.g. feeding, caging and handling animals used in biological research	1	3.05	25	1.72
Inventories products	2	2.58	9	2.66
Disposes of animal carcasses	3	2.58	27	1.41
Supervises animal caretakers	4	2.17	31	.78
Assists the professional in examining animals	5	2.11	20	2.14
Collects fluids such as blood, urine	6	2.05	13	2.49
Maintains accurate cross-indexed breeding records	7	2.00	33	.32
Restrains animals	8	1.83	5	3.14
Breeds and maintains disease free animals	9	1.82	36	.17
Prepares facilities for animal surgery	10	1.64	1	3.41
Tests effects of some biological and pharmaceutical products on animals	11	1.50	37	.17
Performs necropsy dissections	12	1.47	29	1.00
Maintains surgical and small animal care equipment	13	1.47	2	3.34
Answers telephone requests for information about animals	14	1.44	16	2.41
Anesthesizes animals	15	1.41	28	1.24
Prepares animals for surgery	16	1.35	4	3.27

Table III (Continued)

Task Statement	Importance Rank			
	Animal Science Personnel		Veterinarians	
	Rank Order	Mean	Rank Order	Mean
Identifies animal parasites	17	1.33	17	2.35
Prepares reports of drug effects by observing animal responses	18	1.29	34	.32
Analyzes fluids such as urine, bile	19	1.20	12	2.50
Selects and packages specimens for shipment	20	1.11	15	2.49
Performs basic bacteriological procedures	21	1.10	21	2.09
Performs general office duties	22	1.05	8	2.72
Performs emergency first aid on animals	23	1.05	11	2.54
Assists during surgery	24	.94	7	2.80
Performs basic hematological procedures	25	.90	14	2.49
Performs clinical chemical procedures	26	.83	22	2.05
Dispenses medicine and supplies	27	.82	18	2.29
Prepares histological slides	28	.78	30	.82
Grooms animals	29	.59	24	1.82
Assists veterinarian on calls outside the animal hospital	30	.53	26	1.52
Care of animal hospital	31	.47	6	3.05
Conducts immunization studies	32	.44	35	.18
Application of or changing wound dressings	33	.35	23	2.06
Medical treatment of animals in animal hospital	34	.35	19	2.29

Table III (Continued)

Task Statement	Importance Rank			
	Animal Science Personnel		Veterinarians	
	Rank Order	Mean	Rank Order	Mean
Performs artificial insemination on animals	35	.17	32	.76
Operates x-ray equipment	36	.00	10	2.60
Develops x-ray negatives	37	.00	3	3.29

Table IV and Table V report those Task Statements which received importance values which were not significantly different from 2.0 or with importance values of 2.0 or more. This value (2.0) was selected as the minimum acceptable level of importance, since at this level a technician requires only a "moderate competency" in this task. Task statements which received an importance value of less than 2.00 are not regarded as important tasks which technicians in these areas perform.

Table IV

ANIMAL CARE PERSONNEL - IMPORTANT TASK STATEMENTS

1.	Cares for animals e.g. feeding, caging and handling animals used in biological research
2.	Inventories products
3.	Disposes of animal carcasses
4.	Supervises animal caretakers
5.	Assists the professional in examining animals
6.	Collects fluids such as blood, urine
7.	Maintains accurate cross-indexed breeding records
8.	Restrains animals
9.	Breeds and maintains disease free animals
10.	Prepares facilities for animal surgery
11.	Tests effects of some biological and pharmaceutical products on animals
12.	Performs necropsy dissections
13.	Maintains surgical and small animal care equipment
14.	Answers telephone requests for information about animals

Table V

VETERINARIANS
IMPORTANT TASK STATEMENTS

1.	Prepares facilities for animal surgery
2.	Maintains surgical and animal care equipment
3.	Develops x-ray negatives
4.	Prepares animals for surgery
5.	Restrains animals
6.	Care of animal hospital
7.	Assists during surgery
8.	Performs general office duties
9.	Inventories products
10.	Operates x-ray equipment
11.	Performs emergency first aid on animals
12.	Analyzes fluids such as urine, bile
13.	Collects fluids such as blood, urine
14.	Performs basic hematological procedures
15.	Selects and packages specimens for shipment
16.	Answers telephone requests for information about animals
17.	Identifies animal parasites
18.	Dispenses medicine and supplies
19.	Application of or changing wound dressings
20.	Assists the professional in examining animals
21.	Performs basic bacteriological procedures
22.	Performs clinical chemical procedures
23.	Medical treatment of animals in animal hospital
24.	Grooms animals
25.	Cares for animals, e.g. feeding, caging, and handling animals used in biological research
26.	Assists veterinarians on calls outside the animal hospital

Table IV and Table V indicates that animal care personnel and veterinarians differ in their opinions as to the task statements which are important.

Comparisons Between The Groups

Comparisons were made to determine differences in responses to the task statements by the different groups. These comparisons are based on the results which are listed in Appendix VII and IX. For convenience only those task statements with a probability value of less than .05 are listed here, since these values show task statements with significant differences in responses between the two groups.

Comparison 1 determined the differences in the opinions of Metro Winnipeg Veterinarians and Veterinarians in practices located outside Metro Winnipeg. (Group 2 and 3). The hypothesis tested was that there are no significant differences between the groups in responses based on the means of each task statement.

H_o: $u_1 = u_1'$ for each task statement.

The null hypothesis is rejected in the following task statements:

Dispenses medicine and supplies: probability value .02

Performs basic hematological procedures: probability value .03

Comparison 2 determined the differences in the opinions of Animal Science Personnel and Veterinarians. (Group 1 and Groups 2 plus 3). They hypothesis tested was that there are significant differences between the groups in responses based on the means of each task statement.

H_1: $u_1 \neq u_2$

This hypotheses was supported for the task statements which are listed in Table VI.

Table VI

TASK STATEMENTS WITH SIGNIFICANT DIFFERENCES BETWEEN ANIMAL SCIENCE PERSONNEL AND VETERINARIANS

Task Statement	Probability Value
Performs general office duties	.00
Answers telephone requests for information about animals	.02
Cares for animals e.g. feeding, caging and handling animals used in biological research	.01
Care of animal hospital	.00
Medical treatment of animals in animal hospital	.00
Application of or changing wound dressings	.00
Grooms animals	.00
Supervises animal caretakers	.00
Dispenses medicine and supplies	.00
Tests effects of some biological and pharmaceutical products on animals	.00
Analyzes fluids such as urine, bile	.00
Performs basic hematological procedures	.00
Performs clinical chemical procedures	.01
Identifies animal parasites	.03
Selects and packages specimens for shipment	.00
Disposes of animal carcasses	.01
Prepares facilities for animal surgery	.00
Prepares animals for surgery	.00
Maintains surgical and small animal care equipment	.00
Assists during surgery	.00
Restrains animals	.00
Operates x-ray equipment	.00
Develops x-ray negatives	.00
Breeds and maintains disease free animals	.00
Maintains accurate cross-indexed breeding records	.00
Performs emergency first aid on animals	.00
Assists veterinarian on calls outside the animal hospital	.01

Chapter 5

CONCLUSIONS AND DISCUSSION

In order to facilitate a better understanding of the results, this chapter is divided into two sections. The first section is the conclusions where the original questions are restated and conclusions made. The second section is a discussion of the conclusions.

CONCLUSIONS

> What are the opinions of practising veterinarians and professionals in Animal science as to the need for qualified Veterinary assistants and Animal care technicians in Manitoba?

The results indicated that in the opinion of the majority of practising veterinarians in Manitoba, there was no need for qualified veterinary assistance at the present time. Professionals in Animal science employ technicians to perform a variety of laboratory duties, but the numbers employed are kept to a minimum because of a lack of necessary funds. Both groups of professionals surveyed, indicated that there was no need to train special technicians in animal care and veterinary assistance, but that employment opportunities would be greater for technicians with a diversified training in Animal science.

> What are the different types of tasks performed by veterinary assistants and animal care technicians in Manitoba?
>
> Are there differences in the tasks identified by the two groups of professionals?

The different types of tasks performed by veterinary assistants and animal care technicians as reported by the professionals surveyed are out-

lined in the following section. The following tasks were determined as important to both groups of technicians: cares for animals, e.g. feeding, caging and handling animals used in biological research; inventories products; disposes of animal carcasses; collects fluids such as blood, urine; restrains animals; prepares facilities for animal surgery; maintains surgical and small animal care equipment, and answers telephone requests for information about animals.

Tasks which were important for animal care technicians but not for veterinary assistants were: supervises animal caretakers; maintains accurate cross-indexed-breeding records; breeds and maintains disease free animals; tests effects of some biological and pharmaceutical products on animals; prepares reports of drug effects by observing animal responses and performs necropsy dissections.

Tasks which were important for veterinary assistants but not for animal care technicians are listed below. These are: prepares facilities for animal surgery; operates x-ray equipment; develops x-ray negatives; care of anim l hospital; assists during surgery; performs general office duties; performs emergency first-aid on animals; analyzes fluids such as urine, bile; performs basic hematological procedures; selects and packages specimens for shipment; identifies animal parasites; dispenses medicine and supplies; application of or changing wound dressings; assists the professional in examining animals; performs basic bacteriological procedures; performs clinical chemical procedures; medical treatment of animals in animal hospital; grooms animals and assists veterinarians on calls outside the animal hospital.

Those tasks which were not important in the duties of both animal care technicians and veterinary assistants are: prepares histological slides; conducts immunization studies; performs aritifical insemination on animals, and anesthesizes animals.

What are the initial salaries and promotional opportunities for qualified veterinary assistants and animal care technicians?

The range of starting salaries as indicated by veterinarians to be appropriate for veterinary assistants on a monthly basis is between $500-$700, the majority report a salary range between $500-$600. The initial salaries for technicians in the animal care area as reported by animal science professionals is between $600-$900 per month. The majority of starting salaries was between $701-$900.

Promotional opportunities or reward for satisfactory job performance for technicians in the animal care area are by annual increments, or more job responsibility together with increased salary. Veterinarians were not asked about promotional opportunities for veterinary assistants, however some respondents indicated salaries should increase if job performance was satisfactory.

The hypothesis that there are no significant differences in the opinions of Metro and non Metro Winnipeg veterinarians as determined by the mean value of each task statement was supported for the majority of task statements.

There were significant differences in responses between the two groups to the following task statements: "Dispenses Medicine and Supplies", and "Performs basic hematological procedures". No apparent reason for such differences was evident.

The hypothesis that there are significant differences in responses of professionals in the science area and veterinarians based on the means of

each task statement was supported for the majority of task statements.

Animal care technicians may be involved in areas of general animal care, animal breeding and experimentation on the effects of various pharmaceutical products on animals, while veterinary assistants perform duties in the areas of animal nursing, laboratory testing, radiological and general office duties. It is therefore logical that in a comparison of duties between the two groups many significant differences will result.

Based on the priority list of tasks established in the task analysis, a list of courses which combines the training requirements of animal care technicians and veterinary assistants was developed. Graduates from a program which incorporates all the listed courses, should have the necessary skills which would allow them to work efficiently as technicians in both the animal science and veterinary areas. The courses are outlined as follows:

Animal Nursing: Provision for the care and well being of animals with special knowledge in animal housing, nutritional requirements and safe and proper restraint of animals.

Surgical Assistance: Pre and post surgical care of the patient, care of surgical equipment and assistance with the surgery.

Animal Breeding: Procedures involved in breeding animals, and maintaining adequate records of crosses.

Medicine: Knowledge of the action of the various medications and capabilities in the proper administration of these medications.

Radiography: Capabilities in assisting with the exposure of radiographs and their development.

Laboratory Procedures: Clinical pathology procedures involving the analysis of body functions by running tests on the blood, urine, feces, skin scrapings, exudate and other body samples.

Sanitation: Methods of routing sanitation, sterilizing and disinfecting.

Office Procedures: Ability to answer the telephone, and made recommendations for the care of the animal prior to the veterinarians attention, and to handle minor bookkeeping duties.

DISCUSSION

The areas in which the majority of technicians are employed are in animal science instruction with biomedical research and animal care and/or breeding being the other major areas of employment. Most of the facilities in which these technicians are employed are allied with programs at the University of Manitoba or are involved in biomedical research. However from the views expressed technical staff is kept to a minimum in most of these establishments because of lack of necessary funds.

Since the Veterinary Laboratory at the Provincial Agricultural Services Complex in Fort Garry, currently performs laboratory tests without charge, for veterinarians in Manitoba, there was no present need for veterinarians to set up laboratory facilities and to employ technicians to perform such laboratory tests. However if full cost recovery service fees are charged by the Veterinary Laboratory for performing such laboratory tests the results indicate that the number of veterinary assistants employed by veterinarians would increase.

The difference in the range of starting salaries that would be paid to animal science technicians and veterinary assistants may be attributed to a number of reasons. Technicians in the animal science area are employed in well established private, government aided or governmental facilities. Salaries in these facilities have been determined through well established negotiating systems. The majority of veterinarians are in private practice. The costs involved in purchasing laboratory equipment would prevent many veterinarians from establishing testing facilities on their own, and therefore few veterinary assistants would be required.

Promotional opportunities vary among establishments in the animal science area. In the majority of cases, annual increments, and an increase in salary are the established methods of promotion. Some establishments require technicians to complete additional courses in their area of work, before these technicians could be promoted. In some facilities no promotional opportunities exist, although technicians may receive increased salaries. Such employment areas vary from positions as technician - teaching assistants in university facilities to positions as animal care technicians in animal breeding facilities.

Metro Winnipeg veterinarians operate mainly small animal practices, while rural veterinarians operate mixed or large animal practices. Since veterinarians who practice in rural areas are involved in more out of office work than veterinarians in urban areas experienced technicians working with rural veterinarians may be more involved in the dispensing of medicine and supplies. The differences in opinions which resulted between animal science professionals and veterinarians are due mainly to the different duties which are performed in each occupational area. However as the number of test groups increase the possibility of getting significant results by chance alone also increase. Therefore with a large number of comparisons of individual tasks, some of the many significantly different results which were obtained might have been due to chance alone.

Most of the veterinarians who responded to the survey indicated the Community College was the most appropriate type of training institution for veterinary assistants in Manitoba. Veterinarians would provide field placement experience, and the most appropriate time period for such

experience was between January to June. However veterinarians were not in favour of a training program for veterinary assistants in Manitoba since there were facilities elsewhere in Canada in which adequate numbers of such assistants were being trained.

A comparison of the results of this study to the results of studies conducted in the United States and reported in the Literature Review of this thesis shows similar findings using similar methods. The list of important tasks which was determined by Cooke et al, as Essential to Successful Performance as an Animal Health Technician, parallels the important tasks for Animal Care Technicians (Table IV) as determined from this study.

Brandt et al, recommended that the Animal Science Technology Program at Delhi College, New York, be divided into two areas, namely Laboratory Animal Science Technology (equivalent to Animal Care Technician) and Veterinary Assistant Technology. In Manitoba because of the limited number of technical positions available in the animal science area, it would not be feasible to train animal care technicians and veterinary laboratory assistants separately. Instead, a program to train general animal science technicians would be more suitable. Conclusions as to the curriculum content of each subject in a training program cannot be made from the results of this survey. However recommendations as to the subject areas for this program are appropriate and have been presented elsewhere in this chapter.

RECOMMENDATIONS FOR FURTHER RESEARCH

As a follow-up from this survey it is recommended that further studies be made to determine the curriculum content for a general animal science technician program which incorporates the training requirements of both Animal care technicians and Veterinary assistants.

There are a variety of technical positions in other areas of the Life Sciences. Such areas include Ecology; Environmental Science; Food Science and Plant Science. Further studies should be conducted to determine the availability of technical positions in these areas, as well as the training requirements for such programs.

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APPENDIX I

COVER LETTER TO QUESTIONNAIRE RESPONDENTS

November 26, 1976

Dear Sir or Madam:

As an instructor in the Biological Technology course at Red River Community College, I have become increasingly aware of the possible need for specially trained technicians in the Animal Science Area. These areas include Animal Care Technology, Veterinary Assistants and a cluster of related areas. I would like to determine the opinions of professionals, who might eventually be employing such technicians.

As you are in a responsible position in this field you are among the best qualified to assist in determining these answers.

Please complete the accompanying questionnaire, and return it in the stamped self-addressed return envelope. Complete annonymity is assured. Favourable replies do not commit you to employ or assist in the training of such individuals.

Your response and suggestions will be appreciated.

Yours sincerely,

Loretta Williams

APPENDIX II

QUESTIONNAIRE A

ANIMAL SCIENCE PERSONNEL SURVEY

TO DETERMINE TASKS PERFORMED BY TECHNICIANS IN ANIMAL CARE IN MANITOBA

Notes regarding the questionnaire:

As you proceed through the questionnaire, you may have additional comments, Please write each comment on the back.

Questionnaire Number _____

Position of respondent _____

Question
Number

a. In which of the following type of facility are you employed? Please check one of the following.

1. Biomedical research.....[ ]
2. Animal Science Instruction..[ ]
3. Animal Care and/or Breeding.[ ]
4. Federal Government Regulatory Laboratory..... [ ]
5. Provincial Government Laboratory.....[ ]
6. Other (please specify)

_____

_____

The next group of questions will supply information about individuals employed as technicians in your facility.

b. What is the job title of technical employees in your establishment?

1. Animal Laboratory Technician..... [ ]
2. General Laboratory Technician..... [ ]
3. Veterinary Assistant..... [ ]
4. Animal Care Technician..... [ ]
5. Biomedical Technician..... [ ]
6. Teaching Assistant.....[ ]
7. Animal Inspector.....[ ]
8. Resource Technician.....[ ]
9. Other (please specify)

_____

c. If you do not now employ such technicians what is the reason? Please check one:

1. there are no qualified technicians to fill your requirements....[ ]

2. the facility in which you are employed is too small.....[ ]

3. such technicians, although not now employed, will be hired in the future.....[ ]

4. such technicians are not required in this establishment.....[ ]

5. other (please specify) _____

d. If you do employ such technicians please complete the following section. This section will determine the tasks performed and their relative importance in your establishment.

Please check according to the following code:

KEY NA: item not applicable
1: require slight competency in this task
2: require moderate competency in this task
3: require considerable competency in this task
4: require complete competency in this task

Task					
1. Performs general office duties.....	NA	1	2	3	4
2. Answers telephone requests for information about animals.....	NA	1	2	3	4
3. Cares for animals e.g. feeding, caging and handling animals used in biological research..	NA	1	2	3	4
4. Care of animal hospital.....	NA	1	2	3	4
5. Medical treatment of animals in animal hospital.....	NA	1	2	3	4
6. Application of or changing wound dressings....	NA	1	2	3	4
7. Grooms animals.....	NA	1	2	3	4
8. Supervises animal caretakers.....	NA	1	2	3	4
9. Dispenses medicine and supplies.....	NA	1	2	3	4
10. Inventories products.....	NA	1	2	3	4
11. Tests effects of some biological and pharmaceutical products on animals.....	NA	1	2	3	4

12. Prepares reports of drug effects by observing animal responses.....	NA	1	2	3	4
13. Collects fluids such as blood, urine.....	NA	1	2	3	4
14. Analyzes fluids such as urine, bile.....	NA	1	2	3	4
15. Performs basic hematological procedures.....	NA	1	2	3	4
16. Performs basic bacteriological procedures....	NA	1	2	3	4
17. Performs clinical chemical procedures.....	NA	1	2	3	4
18. Identifies animal parasites.....	NA	1	2	3	4
19. Performs necropsy dissections.....	NA	1	2	3	4
20. Selects and packages specimens for shipment..	NA	1	2	3	4
21. Disposes of animal carcasses.....	NA	1	2	3	4
22. Prepares histological slides.....	NA	1	2	3	4
23. Prepares facilities for animal surgery.....	NA	1	2	3	4
24. Prepares animals for surgery.....	NA	1	2	3	4
25. Maintains surgical and small animal care equipment.....	NA	1	2	3	4
26. Anesthesizes animals.....	NA	1	2	3	4
27. Assists during surgery.....	NA	1	2	3	4
28. Assists the professional in examining animals.....	NA	1	2	3	4
29. Restrains animals.....	NA	1	2	3	4
30. Operates X-ray equipment.....	NA	1	2	3	4
31. Develops X-ray negatives.....	NA	1	2	3	4
32. Breeds and maintains disease free animals....	NA	1	2	3	4
33. Performs artificial insemination on animals..	NA	1	2	3	4
34. Maintains accurate cross-indexed breeding records.....	NA	1	2	3	4
35. Conducts immunization studies.....	NA	1	2	3	4

36. Performs emergency first aid on animals..... NA 1 2 3 4

37. Assists veterinarian on calls outside the animal hospital..... NA 1 2 3 4

38. Other (please specify..... NA 1 2 3 4

_____

Whether you do or do not now employ such technicians, please complete the following section. These three questions are designed to determine education qualification, salary and promotional opportunities.

e. Technicians, currently employed in your facility have the following educational qualification:

1. University Science degree...[ ]
2. Graduate of a Community College or Institute of Technology Science technicians; course.....[ ]
3. High school graduate.....[ ]
4. Other (please specify) _____

f. The present starting salary on a monthly basis is:

1. $500 - 600.....[ ]
2. $601 - 700.....[ ]
3. $701 - 800.....[ ]
4. $801 - 900.....[ ]
5. $901 - 1,000.....[ ]
6. Other (please specify)_____

g. In which of the following ways are such technicians compensated for good job performance?

1. Given more responsibilities only.....[ ]
2. Given another job with more responsibility but no salary increase.....[ ]
3. More responsibility and increased salary.....[ ]
4. Annual increments.....[ ]
5. By successful completion of courses in the area of work, from college, university, seminars or inservice training.....[ ]
6. No promotion opportunities exist.....[ ]

APPENDIX III

QUESTIONNAIRE B

VETERINARIANS IN SMALL AND/OR LARGE ANIMAL PRACTICE SURVEY

TO DETERMINE OPINIONS OF PRACTISING VETERINARIANS AND TO IDENTIFY THE TASKS TO BE PERFORMED BY TECHNICIANS

Notes regarding the questionnaire:

As you proceed through the questionnaire, you may have additional comments, please write such comments on the back.

Questionnaire Number _____

Location of Practice: 1. Metro Winnipeg _____

2. Outside Metro Winnipeg _____

Question Number

a. What type of Veterinary Practice do you now maintain?

1. Small Animal Practice.....[ ] 3. Mixed.....[ ]

2. Large Animal Practice.....[ ] 4. Other (please specify)_____

The next two questions are to determine whether you now employ technicians in your practice and your reasons for or against their employment.

b. What is the job title of technical personnel in your practice? Please check one.

1. Animal Laboratory Technician.....[ ]

2. General Laboratory Technician.....[ ]

3. Veterinary Assistant.....[ ]

4. Animal Care Technician.....[ ]

5. Laboratory Assistant.....[ ]

6. Other (please specify)

_____

c. If you do not now employ such technicians what is your reason? Please check one:

1. There are no qualified technicians to perform tasks you require..[ ]

2. Such technicians are not required in your facility.....[ ]

3. If such technicians are trained they will be hired at your facility.....[ ]

4. Other (please specify)_____

_____

d. Whether you do or do not now employ such technicians, please answer the following section. It is designed to determine the tasks that technicians might perform in an establishment like yours.

Please check according to the following code:

KEY NA: item not applicable
1: require slight competency in this task
2: require moderate competency in this task
3: require considerable competency in this task
4: require complete competency in this task

Task					
1. Performs general office duties.....	NA	1	2	3	4
2. Answers telephone requests for information about animals.....	NA	1	2	3	4
3. Cares for animals e.g. feeding, caging and handling animals used in biological research..	NA	1	2	3	4
4. Care of animal hospital.....	NA	1	2	3	4
5. Medical treatment of animals in animal hospital.....	NA	1	2	3	4
6. Application of or changing wound dressings....	NA	1	2	3	4
7. Grooms animals.....	NA	1	2	3	4
8. Supervises animal caretakers.....	NA	1	2	3	4
9. Dispenses medicine and supplies.....	NA	1	2	3	4
10. Inventories products.....	NA	1	2	3	4
11. Tests effects of some biological and pharmaceutical products on animals.....	NA	1	2	3	4
12. Prepares reports of drug effects by observing animal responses.....	NA	1	2	3	4

13. Collects fluids such as blood, urine.....	NA	1	2	3	4
14. Analyzes fluids such as urine, bile.....	NA	1	2	3	4
15. Performs basic hematological procedures.....	NA	1	2	3	4
16. Performs basic bacteriological procedures....	NA	1	2	3	4
17. Performs clinical chemical procedures.....	NA	1	2	3	4
18. Identifies animal parasites.....	NA	1	2	3	4
19. Performs necropsy dissections.....	NA	1	2	3	4
20. Selects and packages specimens for shipment..	NA	1	2	3	4
21. Disposes of animal carcasses.....	NA	1	2	3	4
22. Prepares histological slides.....	NA	1	2	3	4
23. Prepares facilities for animal surgery.....	NA	1	2	3	4
24. Prepares animals for surgery.....	NA	1	2	3	4
25. Maintains surgical and small animal care equipment.....	NA	1	2	3	4
26. Anesthesizes animals.....	NA	1	2	3	4
27. Assists during surgery.....	NA	1	2	3	4
28. Assists the professional in examining animals.....	NA	1	2	3	4
29. Restrains animals.....	NA	1	2	3	4
30. Operates X-ray equipment.....	NA	1	2	3	4
31. Develops X-ray negatives.....	NA	1	2	3	4
32. Breeds and maintains disease free animals....	NA	1	2	3	4
33. Performs artificial insemination on animals.....	NA	1	2	3	4
34. Maintains accurate cross-indexed breeding records.....	NA	1	2	3	4
35. Conducts immunization studies.....	NA	1	2	3	4
36. Performs emergency first aid on animals.....	NA	1	2	3	4

37. Assists veterinarian on calls outside the animal hospital..... NA 1 2 3 4

38. Other (please specify.....

_____

e. The Veterinary Laboratory, at the Agricultural Services Complex in Fort Garry, currently performs laboratory tests, free of charge, to practising veterinarians. If a full cost recovery service fee is initiated which of the following options would you choose?

1. Continue to use the services of the Veterinary Laboratory.....[ ]

2. Perform certain tests on your own in your facility.....[ ]

3. Employ a qualified Veterinary Assistant, if available.....[ ]

4. Would train an unqualified individual in your own facility.....[ ]

5. Other (please specify)_____

f. If, instead a token service fee is charged, which options from question e. would you select?.....[ ]

g. If you would continue to use the services of the Veterinary Laboratory, is the reason that:

1. Costs involved in employing such technicians would be too high..[ ]

2. There are not enough duties to be performed by such an assistant.....[ ]

3. High school graduates may be trained, at less cost, to satisfactorily perform in the areas that you require.....[ ]

4. You would wait to get reports on the job performance of such technicians from other veterinarians.....[ ]

5. Other (please specify)_____

h. Which of the following types of institutions, do you think would be most appropriate for training such technicians in Manitoba?

1. University.....[ ]
2. Community College.....[ ]
3. Technical-Vocational High School.....[ ]
4. Other (please specify)_____

i. If such a training program is initiated would you be prepared to provide field placement experience (internship) for such trainees. Please respond to one of the following:

1. Yes, at any time.....[ ]
2. Yes, as long as I could select the most convenient time period.....[ ]
3. No, I am usually too busy...[ ]
4. Other (please specify)_____

_____

j. If you would agree to accept an 'intern' the most convenient time period for such an intership would be (please specify)_____

k. The initial monthly estimated salary that you would consider to be appropriate for a technician would be:

1. $500 - 600.....[ ]
2. $601 - 700.....[ ]
3. $701 - 800.....[ ]
4. $801 - 900.....[ ]
5. $901 - 1,000.....[ ]
6. Other (please specify)_____

If you have additional comments, please express them below.

APPENDIX IV

FOLLOW-UP LETTER

L. Williams,
January 3, 1977

Dear Sir/Madam,

In December of 1976, a questionnaire designed to determine your opinions on the training of Veterinary Laboratory Assistants in Manitoba was mailed to you. It is now necessary to analyse the questionnaire and so far I have not received your reply.

In case you have mislaid the first copy, I am including another copy of the questionnaire with this letter. Please complete this and return it in the stamped self-addressed envolope provided.

Your cooperation is greatly appreciated.

Yours truly,

Loretta Williams.

APPENDIX V

ANIMAL SCIENCE PERSONNEL - ADJUSTED FREQUENCIES AND MEANS

Task	Statement	Category Label Code					Mean	Standard Deviation
		NA	1	2	3	4		
1.	Performs general office duties	50.0	16.7	22.2	-	11.1	1.06	1.31
2.	Answers telephone requests for information about animals	38.9	16.7	22.2	5.6	16.7	1.44	1.46
3.	Cares for animals e.g. feeding, caging and handling animals used in biological research	5.3	15.8	5.3	15.8	57.9	3.06	1.31
4.	Care of animal hospital	82.4	5.9	-	5.9	5.9	.47	1.14
5.	Medical treatment of animals in animal hospital	82.4	5.9	5.9	5.9	-	.36	.836
6.	Application of or changing wound dressings	60.9	11.8	-	-	5.9	.35	.96
7.	Grooms animals	94.1	4.3	-	-	-	.60	.23
8.	Supervises animal caretakers	23.5	11.8	17.6	17.6	29.4	2.18	1.54
9.	Dispenses medicine and supplies	64.7	11.8	5.9	11.8	5.9	.82	1.29
10.	Inventories products	17.6	5.9	17.6	17.6	41.2	2.59	1.49
11.	Tests effects of some biological and pharmaceutical products on animals	45.0	15.0	10.0	5.0	25.0	1.50	1.65
12.	Prepares reports of drug effects by observing animal responses	64.7	-	-	11.8	23.5	1.29	1.77
13.	Collects fluids such as blood, urine	33.3	11.1	-	27.8	27.8	2.06	1.68

APPENDIX V (Continued)

Task Statement	Category Label Code					Mean	Standard Deviation
	NA	1	2	3	4		
14. Analyzes fluids such as urine, bile	55.0	5.0	15.0	15.0	10.0	1.20	1.40
15. Performs basic hematological procedures	65.0	10.0	5.0	10.0	10.0	.90	1.41
16. Performs basic bateriological procedures	65.0	5.0	5.0	5.0	20.0	1.10	1.64
17. Performs clinical chemical procedures	72.2	-	5.6	11.1	11.1	.83	1.46
18. Identifies animal parasites	44.4	11.1	11.1	33.3	-	1.33	1.33
19. Performs necropsy dissections	52.9	-	5.9	29.4	11.8	1.48	1.61
20. Selects and packages specimens for shipment	50.0	11.1	22.2	11.1	5.6	1.11	1.28
21. Disposes of animal carcasses	11.8	11.8	17.6	23.5	35.3	2.59	1.37
22. Prepares histological slides	77.8	-	5.6	-	16.7	.78	1.51
23. Prepares facilities for animal surgery	35.3	11.8	17.6	23.5	11.8	1.65	1.45
24. Prepares animals for surgery	52.9	5.9	11.8	11.8	17.6	1.35	1.60
25. Maintains surgical and small animal care equipment	47.1	11.8	5.9	17.6	17.6	1.47	1.61
26. Anesthesizes animals	41.2	17.6	11.8	17.6	11.8	1.41	1.45
27. Assists during surgery	58.8	17.6	5.9	5.9	11.8	.94	1.39
28. Assists the professional in examining animals	29.4	11.8	11.8	11.8	35.3	2.19	1.67
29. Restrains animals	38.9	11.1	5.6	16.7	27.8	1.83	1.70

APPENDIX V (Continued)

Task Statement	Category Label Code					Mean	Standard Deviation
	NA	1	2	3	4		
30. Operates X-ray equipment	100.0	-	-	-	-	0.00	.00
31. Develops X-ray negatives	100.0	-	-	-	-	0.00	.00
32. Breeds and maintains disease free animals	35.3	11.8	17.6	5.9	29.4	1.82	1.65
33. Performs artificial insemination on animals	94.4	-	-	5.6	-	.17	.68
34. Maintains accurate cross-indexed breeding records	47.1	-	-	11.8	41.2	2.00	1.91
35. Conducts immunization studies	77.8	11.1	5.6	-	5.6	.44	1.01
36. Performs emergency first aid on animals	58.8	17.6	-	5.9	17.6	1.06	1.55
37. Assists veterinarian on calls outside the animal hospital	78.9	5.3	5.3	5.3	5.3	.53	1.41

APPENDIX VI

VETERINARIANS - METRO WINNIPEG - ADJUSTED FREQUENCIES AND MEANS

Task Statement	Category Label Code					Mean	Standard Deviation
	NA	1	2	3	4		
1. Performs general office duties	16.7	-	33.3	33.3	16.7	2.33	1.24
2. Answers telephone requests for information about animals	14.3	-	14.3	42.9	28.6	2.71	1.27
3. Cares for animals e.g. feeding, caging and handling animals used in biological research	42.9	-	-	14.3	42.9	2.14	1.88
4. Care of animal hospital	-	-	16.7	16.7	66.7	3.50	.76
5. Medical treatment of animals in animal hospital	14.3	14.3	28.6	-	42.9	2.43	1.49
6. Application of or changing wound dressings	14.3	-	28.6	42.9	14.3	2.43	1.17
7. Grooms animals	57.1	-	28.6	-	14.3	1.43	1.45
8. Supervises animal caretakers	57.1	-	14.3	14.3	14.3	1.29	1.57
9. Dispenses medicine and supplies	57.1	14.3	-	14.3	14.3	1.14	1.55
10. Inventories products	14.3	14.3	14.3	42.9	14.3	2.29	1.27
11. Tests effects of some biological and pharmaceutical products on animals	85.7	14.3	-	-	-	.143	.35
12. Prepares reports of drug effects by observing animal responses	100.0	-	-	-	-	0.00	.00
13. Collects fluids such as blood, urine	14.3	-	14.3	14.3	57.1	3.00	1.41
14. Analyzes fluids such as urine, bile	42.9	-	14.3	-	42.9	2.00	1.81

APPENDIX VI (Continued)

Task Statement	Category Label Code					Mean	Standard Deviation
	NA	1	2	3	4		
15. Performs basic hematological procedures	57.1	14.3	-	-	28.6	1.29	1.75
16. Performs basic bacteriological procedures	57.1	14.3	-	-	28.6	1.29	1.75
17. Performs clinical chemical procedures	57.1	14.3	14.3	-	14.3	1.00	1.41
18. Identifies animal parasites	14.3	-	14.3	28.6	42.9	2.86	1.35
19. Performs necropsy dissections	85.7	-	-	12.5	-	.429	1.05
20. Selects and packages specimens for shipment	28.6	-	14.3	28.6	28.6	2.29	1.57
21. Disposes of animal carcasses	42.9	-	42.9	-	14.3	1.43	1.40
22. Prepares histological slides	85.7	-	14.3	-	-	.29	.70
23. Prepares facilities for animal surgery	-	-	14.3	-	85.7	3.72	.70
24. Prepares animals for surgery	-	-	16.7	16.7	66.7	3.50	.76
25. Maintains surgical and small animal care equipment	-	-	14.3	-	85.7	3.71	.70
26. Anesthesizes animals	42.9	14.3	-	-	42.9	1.86	1.88
27. Assists during surgery	14.3	-	14.3	14.3	57.1	3.00	1.41
28. Assists the professional in examining animals	28.6	14.3	14.3	-	42.9	2.14	1.72
29. Restrains animals	-	-	28.6	14.3	57.1	3.29	.88
30. Operates X-ray equipment	14.3	-	-	14.3	71.4	3.29	1.38

APPENDIX VI (Continued)

Task Statement	Category Label Code					Mean	Standard Deviation
	NA	1	2	3	4		
31. Develops X-ray negatives	-	-	14.3	-	85.7	3.71	.70
32. Breeds and maintains disease free animals	100.0	-	-	-	-	0.00	.00
33. Performs artificial insemination on animals	71.4	-	-	-	28.6	1.14	1.80
34. Maintains accurate cross-indexed breeding records	100.0	-	-	-	-	0.00	.00
35. Conducts immunization studies	100.0	-	-	-	-	0.00	.00
36. Performs emergency first aid on animals	28.6	-	14.3	14.3	42.9	2.43	1.67
37. Assists veterinarian on calls outside the animal hospital	71.4	-	14.3	-	14.3	.86	1.45

APPENDIX VII

VETERINARIANS - OUTSIDE METRO WINNIPEG - ADJUSTED FREQUENCIES AND MEANS

Task	Statement	Category Label Code					Mean	Standard Deviation
		NA	1	2	3	4		
1.	Performs general office duties	3.7	3.7	25.9	40.7	25.9	2.81	.98
2.	Answers telephone requests for information about animals	7.4	25.9	11.1	37.0	18.5	2.33	1.24
3.	Cares for animals e.g. feeding, caging and handling animals used in biological research	50.0	3.8	3.8	19.2	23.1	1.62	1.73
4.	Care of animal hospital	7.1	7.1	10.7	32.1	42.9	2.96	1.20
5.	Medical treatment of animals in animal hospital	19.2	23.1	15.4	26.9	15.4	1.96	1.37
6.	Application of or changing wound dressings	11.1	18.5	29.6	14.8	25.9	2.26	1.32
7.	Grooms animals	14.8	22.2	29.6	14.8	18.5	2.00	1.30
8.	Supervises animal caretakers	80.8	-	3.8	3.8	11.5	.654	1.38
9.	Dispenses medicine and supplies	14.3	3.6	25.0	25.0	32.1	2.57	1.34
10.	Inventories products	7.1	7.1	25.0	25.0	35.7	2.75	1.21
11.	Tests effects of some biological and pharmaceutical products on animals	92.6	3.7	-	-	3.7	.18	.77
12.	Prepares reports of drug effects by observing animal responses	85.2	-	3.7	7.4	3.7	.407	1.06
13.	Collects fluids such as blood, urine	25.0	7.1	10.7	21.4	35.7	2.36	1.60
14.	Analyzes fluids such as urine, bile	22.2	-	14.8	18.5	44.4	2.63	1.50

APPENDIX VII (Continued)

Task Statement	Category Label Code					Mean	Standard Deviation
	NA	1	2	3	4		
15. Performs basic hematological procedures	17.9	3.6	10.7	17.9	50.0	2.79	1.52
16. Performs basic bacteriological procedures	35.7	-	7.1	14.3	42.9	2.29	1.79
17. Performs clinical chemical procedures	25.0	10.7	10.7	14.3	39.3	2.32	1.64
18. Identifies animal parasites	33.3	3.7	11.1	11.1	40.7	2.22	1.75
19. Performs necropsy dissections	63.0	3.7	3.7	14.8	14.8	1.15	1.60
20. Selects and packages specimens for shipment	17.9	3.6	25.0	14.3	39.3	2.53	1.47
21. Disposes of animal carcasses	48.1	14.8	7.4	7.4	22.2	1.41	1.63
22. Prepares hisotological slides	70.4	3.7	3.7	3.7	18.5	.963	1.59
23. Prepares facilities for animal surgery	-	3.7	11.1	3.33	51.9	3.33	.81
24. Prepares animals for surgery	-	3.7	18.5	29.6	48.1	3.22	.87
25. Maintains surgical and small animal care equipment	-	7.1	14.3	25.0	53.6	3.25	.95
26. Anethesizes animals	57.7	11.5	11.5	3.8	15.4	1.08	1.49
27. Assists during surgery	3.6	10.7	28.6	21.4	35.7	2.75	1.15
28. Assists the professional in examining animals	21.4	14.3	21.4	14.3	28.6	2.14	1.50
29. Restrains animals	3.6	7.1	14.3	25.0	50.0	3.11	1.11
30. Operates X-ray equipment	17.9	14.3	10.7	21.4	35.7	2.43	1.52

APPENDIX VII (Continued)

Task Statement	Category Label Code					Mean	Standard Deviation
	NA	1	2	3	4		
31. Develops X-ray negatives	7.1	3.6	3.6	35.7	50.0	3.18	1.13
32. Breeds and maintains disease free animals	88.9	7.4	-	-	3.7	.222	.78
33. Performs artificial insemination on animals	74.1	7.4	3.7	7.4	7.4	.66	1.27
34. Maintains accurate cross-indexed breeding records	88.9	-	-	3.7	7.4	.41	1.16
35. Conducts immunization studies	96.3	-	-	-	3.7	.15	.75
36. Performs emergency first aid on animals	14.3	7.1	21.4	21.4	35.7	2.57	1.40
37. Assists veterinarian on calls outside the animal hospital	33.3	14.8	14.8	22.2	14.8	1.70	1.48

APPENDIX VIII

ANALYSIS OF RESPONSES OF METRO WINNIPEG VETERINARIANS, (GROUP I) AND VETERINARIANS IN PRACTICE OUTSIDE METRO WINNIPEG, (GROUP II)

Task Statement	Group	Mean	Standard Deviation	F Value	2 Tail Probability	Pooled Variance Estimate			
						T Value	Degrees of Freedom	2 Tail Probability	Significance
1	1	2.33	1.36	1.86	.272	-1.00	31	.326	NS
	2	2.81	1.00						
2	1	2.71	1.38	1.18	.69	.70	32	.492	NS
	2	2.33	1.27						
3	1	2.14	2.03	1.33	.56	.68	31	.50	NS
	2	1.61	1.76						
4	1	3.50	.837	2.17	.39	1.01	32	.32	NS
	2	2.96	1.23						
5	1	2.42	1.61	1.34	.55	.76	31	.45	NS
	2	1.96	1.39						
6	1	2.42	1.27	1.12	.97	.30	32	.767	NS
	2	2.25	1.3						
7	1	1.14	1.57	1.40	.50	-1.47	32	.153	NS
	2	2.00	1.33						
8	1	1.28	1.70	1.46	.46	1.01	31	.32	NS
	2	.65	1.41						
9	1	1.14	1.67	1.49	.43	-2.09	33	.02	*
	2	2.57	1.37						

APPENDIX VIII (Continued)

Task Statement	Group	Mean	Standard Deviation	F Value	2 Tail Probability	Pooled Variance Estimate			Significance
						T Value	Degrees of Freedom	2 Tail Probability	
10	1	2.28	1.38	1.25	.62	-.87	33	.391	NS
	2	2.75	1.23						
11	1	.14	.37	4.33	.07	-.14	32	.892	NS
	2	.18	.78						
12	1	.00	.00	.00	1.00	-.98	32	.33	NS
	2	.40	1.08						
13	1	3.00	1.52	1.15	.94	.94	33	.35	NS
	2	2.35	1.63						
14.	1	2.00	2.00	1.57	.39	-.88	32	.38	NS
	2	2.62	1.59						
15	1	1.28	1.89	1.49	.43	-1.94	33	.03	*
	2	2.7	1.54						
16	1	1.28	1.89	1.07	.804	-1.29	33	.20	NS
	2	2.28	1.82						
17	1	1.00	1.52	1.21	.88	-1.89	33	.06	NS
	2	2.32	1.67						
18	1	2.85	1.46	1.48	.65	.87	32	.39	NS
	2	2.22	1.78						
19	1	.42	1.13	2.08	.368	-1.09	32	.28	NS
	2	1.14	1.63						

APPENDIX VIII (Continued)

Task Statement	Group	Mean	Standard Deviation	F Value	2 Tail Probability	Pooled Variance Estimate			Significance
						T Value	Degrees of Freedom	2 Tail Probability	
20	1	2.28	1.70	1.29	.593	-.38	33	.704	NS
	2	2.53	1.50						
21	1	1.42	1.51	1.22	.87	.03	32	.97	NS
	2	1.40	1.67						
22	1	.28	.75	4.64	.06	-1.06	32	.29	NS
	2	.96	1.62						
23	1	3.71	.75	1.21	.87	1.10	32	.28	NS
	2	3.33	.83						
24	1	3.50	.83	1.14	.98	.70	31	.49	NS
	2	3.22	.89						
25	1	3.71	.75	1.64	.56	1.18	33	.24	NS
	2	3.25	.96						
26	1	1.85	2.03	1.79	.28	1.12	31	.271	NS
	2	1.07	1.52						
27	1	3.00	1.52	1.69	.32	.47	33	.63	NS
	2	2.75	1.17						
28	1	2.14	1.86	1.48	.445	.00	33	1.00	NS
	2	2.14	1.53						
29	1	3.28	.95	1.42	.70	.38	33	.70	NS
	2	3.10	1.33						

APPENDIX VIII (Continued)

Task Statement	Group	Mean	Standard Deviation	F Value	2 Tail Probability	Pooled Variance Estimate			Significance
						T Value	Degrees of Freedom	2 Tail Probability	
30	1	3.28	1.49	1.07	1.02	1.32	33	.19	NS
	2	3.10	1.55						
31	1	3.71	.75	2.34	.29	1.16	33	.15	NS
	2	3.17	1.15						
32	1	.00	.00	.00	1.00	-.73	32	.47	NS
	2	.22	.81						
33	1	1.14	1.95	2.25	.140	.78	32	.44	NS
	2	.66	1.30						
34	1	0.00	0.00	.00	1.00	-.90	32	.37	NS
	2	.40	1.18						
35	1	0.00	.00	.00	1.00	.50	32	.61	NS
	2	.14	.77						
36	1	2.42	1.81	1.62	-.36	-.22	33	.82	NS
	2	2.57	1.42						
37	1	.85	1.57	1.08	.80	-1.31	32	.20	NS
	2	1.70	1.51						

*Indicates a significant difference in opinions between the two groups.

NS: indicates no significant difference in opinions between the two groups.

APPENDIX IX

ANALYSIS OF RESPONSES OF ANIMAL SCIENCE PERSONNEL, (GROUP I) AND VETERINARIANS, (GROUP II)

Task Statement	Group	Mean	Standard Deviation	F Value	2 Tail Probability	Pooled Variance Estimate			
						T Value	Degrees of Freedom	2 Tail Probability	Significance
1	1	1.06	1.34	1.59	.24	-4.86	49	.00	*
	2	2.73	1.07						
2	1	1.44	1.50	1.38	.42	-2.44	50	.02	*
	2	2.41	1.28						
3	1	3.05	1.35	1.78	.196	2.78	50	.018	*
	2	1.72	1.80						
4	1	.47	1.18	1.00	1.04	-7.39	49	.00	*
	2	3.06	1.18						
5	1	.35	.862	2.77	.034	-5.24	46.70	.00	*
	2	2.06	1.435			Separate variance estimate			
6	1	.35	.99	1.74	.239	-5.36	49	.00	*
	2	2.29	1.315						
7	1	.05	.24	33.45	.00	-7.13	36.79	.00	*
	2	1.82	1.40			Separate variance estimate			
8	1	2.17	1.59	1.16	.69	3.07	48	.00	*
	2	.78	1.47						
9	1	.82	1.33	1.31	.57	-3.37	50	.00	*
	2	2.28	1.52						

APPENDIX IX (Continued)

Task Statement	Group	Mean	Standard Deviation	F Value	2 Tail Probability	Pooled Variance Estimate			
						T Value	Degrees of Freedom	2 Tail Probability	Significance
10	1	2.58	1.54	1.50	.31	-.17	50	.864	NS
	2	2.65	1.25						
11	1	1.50	1.70	.56	.00	3.31	23.03	.003	*
	2	.176	.71			Separate variance estimate			
12	1	1.29	1.82	3.51	.002	2.05	20.68	.05	NS
	2	.32	.97			Separate variance estimate			
13	1	2.05	1.73	1.15	.708	-.90	51	.37	NS
	2	2.48	1.61						
14	1	1.20	1.50	1.23	.641	-2.86	52	.006	*
	2	2.50	1.67						
15	1	.90	1.44	1.39	.45	-3.50	53	.001	*
	2	2.48	1.70						
16	1	1.10	1.68	1.21	.66	-1.96	53	.05	NS
	2	2.08	1.85						
17	1	.83	1.50	1.30	.57	-2.56	51	.01	*
	2	2.05	1.71						
18	1	1.33	1.37	1.57	.32	-2.17	50	.03	*
	2	2.35	1.72						
19	1	1.47	1.66	1.14	.72	.99	49	.32	NS
	2	1.00	1.55						

APPENDIX IX (Continued)

Task Statement	Group	Mean	Standard Deviation	F Value	2 Tail Probability	Pooled Variance Estimate			
						T Value	Degrees of Freedom	2 Tail Probability	Significance
20	1	1.11	1.32	1.32	.54	-3.25	51	.002	*
	2	2.48	1.52						
21	1	2.58	1.41	1.30	.58	2.55	49	.01	*
	2	1.41	1.61						
22	1	.77	1.55	1.06	.84	-.10	50	.91	NS
	2	.82	1.50						
23	1	1.64	1.49	3.33	.003	-4.53	20.94	.00	*
	2	3.41	.82			Separate variance estimate			
24	1	1.35	1.65	3.58	.002	-4.47	20.73	.00	*
	2	3.27	.87			Separate variance estimate			
25	1	1.47	1.66	3.15	.005	-4.32	21.09	.00	*
	2	3.34	.93			Separate variance estimate			
26	1	1.41	1.50	1.19	.72	.36	48	.72	NS
	2	1.24	1.64						
27	1	.94	1.43	1.36	.44	-4.84	50	.00	*
	2	2.80	1.23						
28	1	2.11	1.72	1.20	.62	-.05	50	.95	*
	2	2.14	1.57						
29	1	1.83	1.75	2.61	.01	-2.89	23.91	.008	*
	2	3.14	1.08			Separate variance estimate			

APPENDIX IX (Continued)

Task Statement	Group	Mean	Standard Deviation	F Value	2 Tail Probability	Pooled Variance Estimate			
						T Value	Degrees of Freedom	2 Tail Probability	Significance
30	1	.00	.00	.00	1.00	-6.85	50	.00	*
	2	2.60	1.55						
31	1	.00	.00	.00	1.00	-12.61	51	.00	*
	2	3.28	1.10						
32	1	1.82	1.70	5.66	.00	3.82	18.88	.00	*
	2	.17	.71			Separate variance estimate			
33	1	.16	.70	4.13	.00	-2.01	49.85	.05	NS
	2	.76	1.43						
34	1	2.00	1.96	3.42	.00	3.28	20.81	.00	*
	2	.32	1.06			Separate variance estimate			
35	1	.44	1.04	2.31	.03	1.20	25.02	.24	NS
	2	.11	.68			Separate variance estimate			
36	1	1.05	1.60	1.16	.68	-3.30	50	.00	*
	2	2.54	1.48						
37	1	.52	1.17	1.73	.21	-2.46	51	.01	*
	2	.52	1.54						

*Indicates a significant difference in opinions between the two groups.

NS: Indicates no significant difference in opinion between the two groups.