Economic Impact Assessment of the Veterinary Medical Sector in Alberta

Prepared for the Alberta Veterinary Medical Association

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Table of Contents

Executive Summary

Background

Veterinary medicine encompasses a wide range of services to promote animal health and welfare, prevent and relieve animal suffering, protect the health of the public and the environment, and advance comparative medical knowledge. Veterinarians and veterinary technologists ("veterinary professionals") provide these services in both urban and rural settings through community practices, referral emergency and specialist practices, in-home and on-farm and using technologies such as telemedicine in certain cases.

The Alberta Veterinary Medical Association (the "ABVMA") engaged MNP LLP ("MNP") to undertake an economic impact study to document the economic benefits of veterinary medicine to the province, as well as the role played by veterinary medicine in relation to key industries, public health, food security and sustainability of local communities.

Industry Profile

Veterinary professionals not only provide medical and surgical care to animals but are also involved in research, education, and inspection activities related to animal and human welfare. In Alberta, over 90 percent of veterinarians work in veterinary practice settings, however, there are also a number of veterinarians and veterinary technologists that are employed by industry, academia and government. The figure below includes a summary of key statistics related to the industry in 2020.

Key Industry Statistics

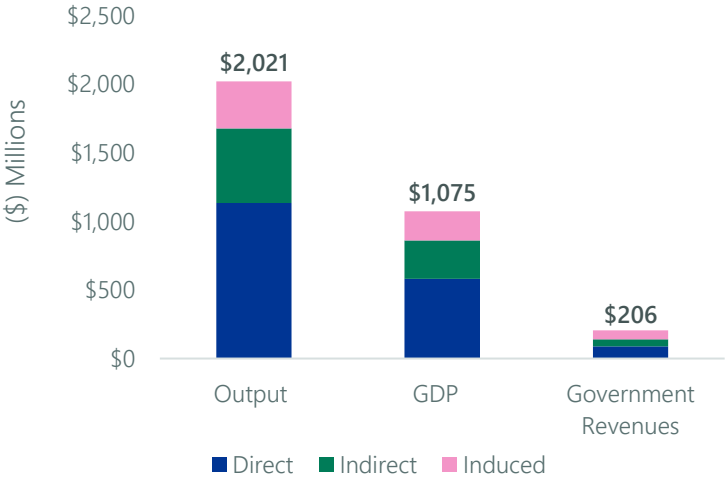
- In 2020, there were **1,832 registered veterinarians** and **1,852 veterinary technologists** working in Alberta.
- In 2020, there were **554 veterinary practices** in Alberta.[1]
- Veterinary practices in Alberta employed over **6,600 full-time equivalent (FTE)** employees including associate veterinarians, veterinary technologists and other practice staff in 2020.[2]
- Total veterinary practice revenues in 2020 were estimated to be approximately $1.1 billion.

[1] For the purposes of estimating the economic impacts, the definition of veterinary practice encompasses organizations categorized as Companion Animal, Mixed Animal, Food Animal, and Equine practices and excludes Zoo/Wildlife, Education, and other practices.

[2] Direct employment includes veterinarians, veterinary technologists and other practice staff. The number of veterinarians and veterinary technologists are based on registration data provided by the ABVMA. The number of other practice staff were estimated based on a full-time veterinarian working 1,750 hours per year and the ratio of hours of support staff for each hour of a veterinarians time from the Canadian Veterinary Medical Association Economic Report for Alberta 2020. The total hours of support staff time were converted to FTEs based on annual hours per FTE of 1,920.

Economic Impacts

The total revenues of Alberta veterinary practices in 2020 were estimated to be approximately $1.1 billion.[3] Based on this value, the estimated annual economic impacts generated by veterinary practices in Alberta are as follows:



Additionally, household spending of veterinarians working in other industries was estimated to generate approximately:

- $11 million in provincial output.
- $7 million in provincial GDP.
- 60 FTE jobs.
- $2 million in taxes for all three levels of government.

Comparison with Other Industries

To provide perspective on the size of the economic impacts of veterinary medicine in Alberta, it is useful to compare the impacts with those created by other industries and sectors. The following are comparisons of the profession's impacts with the new home construction industry, crop and animal production, health care sector and tourism spending in Alberta.

- New home construction: The direct and indirect jobs supported by the veterinary practices (8,611 FTEs) are roughly equivalent to the employment supported by the construction of 3,600 new homes in Alberta.[4] This represents approximately 15 percent of the total new homes constructed in Alberta in 2020.[5]

[3] Veterinary practices were estimated to generate between $530,000 to $680,000 in revenues per full-time equivalent (FTE) veterinarian and had expenditures between $440,000 to $550,000 per FTE veterinarian in 2020 depending on the type of practice. CVMA's economic surveys define a Full-Time Equivalent (FTE) veterinarian as a veterinarian working 1,750 hours annually. Practice wide estimates of revenues and expenditures were developed using total number of veterinarians and mean/median annual hours worked.

[4] Canadian Home Builders' Association, Economic Impacts of New Home Construction. Available here: https://www.chba.ca/impacts

[5] There were approximately 24,000 housing starts in Alberta in 2020. Source: Canadian Home Builders' Association, Economic Impacts of New Home Construction. Available here: https://www.chba.ca/impacts

- Crop and animal production: The crop and animal production industry contributed approximately $4.5 billion to Alberta's GDP in 2018.[6] The direct GDP generated from operation of veterinary practices ($582 million) was estimated to be equivalent to approximately 13 percent of the GDP contribution of the crop and animal production industry.
- Health care: Alberta's health care sector contributed approximately $19 billion to the provincial GDP in 2018. The direct GDP generated from operations of veterinary practices ($582 million) was estimated to be equivalent to approximately 3 percent of the GDP contribution of the health care sector.
- Tourism: The tourism spending in Alberta contributed approximately $3.5 billion to Alberta's GDP in 2019.[7] The direct GDP generated from operation of veterinary practices ($582 million) was estimated to be equivalent to approximately 17 percent of the GDP contribution of tourism spending.

It is important to note that the veterinary medicine industry offers long-term, stable employment whereas employment in the construction and tourism industries may be project based or seasonal.

Broader Economic, Social, and Community Contributions

In addition to quantitative impacts of veterinary medicine in Alberta, there are impacts of broader economic, social and community contributions that are not always quantifiable. These include:

Alberta's Rural Areas. Agriculture has historically been, and continues to be a key industry in Alberta. In 2020, Alberta's agriculture industry employed approximately 42,500 people and contributed over $6 billion to Canada's Gross Domestic Product ("GDP").[8] As such, access to local veterinary services for farmers and livestock producers in rural areas is essential for the sustainability of the agriculture industry as well as Alberta's economy as a whole.

Local veterinary professionals are necessary to provide preventative and emergency care for rural residents' pets as well as livestock and food animals throughout their lifecycle. In emergency situations, the time required to reach a larger centre or the nearest veterinary clinic, or have a veterinarian travel to a remote location for livestock animals for example, may severely impact treatment options and welfare of the animal.

Disease Monitoring and Public Health. Veterinary professionals play an important role in identifying, monitoring, treating and preventing diseases in animals as well as in people. In addition to performing routine health examinations, maintaining immunization programs, implementing parasite control

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[6] Statistics Canada. Table: 36-10-0402-01. Gross domestic product (GDP) at basic prices, by industry, provinces and territories, growth rates (x 1,000,000)

[7] Alberta Jobs, Economy and Innovation (Statistics Canada, Visitor Spending Model for Alberta – 2019 numbers). Available here https://industry.travelalberta.com/visitor-market-insight/tourism-indicators/alberta-tourism-indicators.

[8] Government of Alberta, 2020 Agriculture Statistics Factsheet. August 2021. Available here: https://open.alberta.ca/dataset/79f01912-5e5c-469e-8cf4-97cfc6901cea/resource/745669c0-cba5-449d-b1a3-0402fa015d8c/download/af-itrb-agriculture-statistics-factsheet-2020.pdf

programs, identifying and advising on the risks of disease in animals, veterinarians, supported by veterinary technologists, also diagnose, investigate, and help control zoonotic diseases that affect public health.

Food Safety and Food Security. The numerous roles that veterinarian professionals play at every level of Alberta's food supply chain are critical to the success of the industry and the health of human and animal populations. Through various activities such as farm inspections and disease surveillance, veterinary professionals help ensure the financial stability of animal agriculture and that animal protein produced in Alberta is safe for consumption.

1. Introduction

1.1 Background

Veterinary medicine encompasses a wide range of services to promote animal health and welfare, prevent and relieve animal suffering, protect the health of the public and the environment, and advance comparative medical knowledge.[9] Veterinarians and veterinary technologists ("veterinary professionals") provide these services in both urban and rural settings through community practices, referral emergency and specialist practices, in-home and on-farm, and using technologies such as telemedicine in certain cases.

The Alberta Veterinary Medical Association (the "ABVMA") is the regulatory body in Alberta responsible for registration of veterinary professionals including veterinarians and veterinary technologists, and the certification/inspection of veterinary practices in the province. The ABVMA also sets practice standards and accepts and investigates complaints from the public.

The ABVMA engaged MNP LLP ("MNP") to undertake an economic impact study to document the economic benefits of veterinary medicine to the province as well as the role played by veterinary medicine in relation to key industries, public health, food security and safety, and the sustainability of local communities. The scope of the study included:

- Developing a profile of the veterinary profession in Alberta including information on types of services provided and how the profession supports various sectors.
- Estimating the economic impacts generated by the veterinary medicine industry in Alberta.
- Developing case studies that describe broader economic, social and community contributions of the profession.

1.2 Approach

In preparing this report, MNP carried out the following activities:

- Gathered and analyzed data provided by the ABVMA, as well as information available from previous workforce studies.
- Developed economic impact estimates of veterinary professionals in Alberta following an input-output methodology using provincial multipliers published by Statistics Canada.
- Conducted interviews with representatives of the profession to inform case studies and fill gaps in available information.
- Developed case studies of broader economic and social contributions of the profession based on the information from interviews.
- Developed a report of the findings of our analysis.

[9] Canadian Veterinary Medical Association, The Canadian Veterinary Oath. 2018. Available here: https://www.canadianveterinarians.net/about/veterinary-oath

1.3 Report Structure

The remaining sections of this report are organized as follows:

- Section 2 provides an overview of veterinary medicine in Alberta.
- Section 3 provides an overview of the economic impact methodology used in this study.
- Section 4 presents a summary of the economic impacts created by veterinary professionals.
- Section 5 provides an overview of types and occupations of jobs created by veterinary practices.
- Section 6 presents case studies on broader economic and social contributions of the profession.
- The appendices provide additional detail on the economic impact methodology and relevant assumptions and background information about MNP.

1.4 Report Limitations

We have relied upon the completeness, accuracy and fair presentation of all information and data obtained from the ABVMA and public sources, believed to be reliable. The accuracy and reliability of the findings and opinions expressed in the presentation are conditional upon the completeness, accuracy and fair presentation of the information underlying them. As a result, we caution readers not to rely upon any findings or opinions for business or investment purposes and disclaim any liability to any party who relies upon them as such.

The findings and opinions expressed in the presentation constitute judgments as of the date of the presentation and are subject to change without notice. MNP is under no obligation to advise of any change brought to its attention which would alter those findings or opinions.

2. Veterinary Medicine in Alberta

2.1 Regulatory Environment

The ABVMA is the Professional Regulatory Organization responsible for the practice of veterinary medicine in Alberta under the authority of the *Veterinary Profession Act*. Its responsibilities include the certification and inspection of veterinary practices, as well as implementing processes to ensure veterinary professionals perform their duties in a skillful and professional manner consistent with accepted standards.[10]

As a self-governing profession, the ABVMA performs its regulatory and professional functions in accordance with the legislation, and in a manner responsible to the public of Alberta through the Government of Alberta's Ministry of Labour and Immigration.

All veterinary professionals are required to be members of the ABVMA. In 2020, the ABVMA's membership included:

- 1,800+ veterinarians
- 1,800+ veterinary technologists
- 450+ non-practicing/retired veterinarians and veterinary technologists
- 150+ veterinary students
- 400+ animal health technology students[11]

Source: ABVMA, Annual Reports

2.2 Overview of Veterinary Services

Types of Veterinary Services

Veterinary medicine is a diverse profession. Veterinary professionals not only provide medical and surgical care to animals but are also involved in research, education, and inspection activities related to animal and human welfare. The types of services provided by veterinary professionals can broadly be classified into the following categories:

Companion Animal

Companion animal practices treat dogs and cats as well exotic species such as birds, aquarium fish, reptiles and small mammals. They provide medical, dental and surgical procedures, as well as vaccination services to prevent the spread of diseases. Other services that may be provided are nutrition and behaviour counselling and reproduction management.

[10] ABVMA, ABVMA Vision, Mission, Objectives, Values, Role and Strategic Directions. Available here: https://www.abvma.ca/site/about/abvmamission?nav=mainsidebar

[11] Note: In Alberta, the post-secondary diploma is animal health technology. After earning the diploma and completing the national examination, individuals receive the designation of registered veterinary technologist.

Food Animal

Food animal practices provide medical and surgical services for livestock including but not limited to sheep, cattle, goats, swine, and poultry. Veterinarians working in these practices play an important role in food safety and security through veterinary oversight of agricultural operations to maintain animal health and welfare. This includes consultation on disease prevention and treatment, biosecurity, nutrition, and reproduction.

Equine

Equine veterinary practices provide medical and surgical care to individual horses and herd health management. Equine veterinarians support exhibitions, cultural and competitive events such as horse racing, rodeos, show jumping and horse shows. Veterinarians are also essential in certification of the health of horses for export.

Wildlife, Exotic and Zoo Animals

Veterinarians are employed by zoos, wildlife rehabilitation facilities and national parks to provide specialized health care. They also participate in research on protecting endangered wildlife species.

Research and Industry

Veterinary professionals working in research benefit both animal and human medicine. Some research is geared to improving animal disease prevention, diagnostic tests and treatment. Other research is in translational medicine where animal models are used to research and improve diagnosis and treatment of conditions in humans, as well as studying disease transmissible between animals and humans. In all cases, veterinary professionals care for animals participating in research trials.

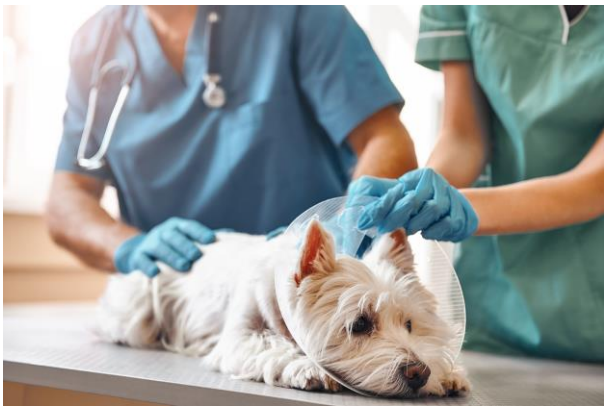
Education

Veterinarians working in education teach in veterinary colleges and universities, animal health technology programs, as well specialized training programs for veterinary professionals.

Government Food Safety and Inspection

Veterinary professionals employed by government are responsible for assistance in developing and enforcing regulations and providing safety and inspection services. They test and inspect animal food products such as meat, eggs and dairy to ensure they are disease free and safe for consumption. They are also involved in testing animals for import and export, as well as the approval of veterinary biologics, research, and diagnostic testing of animal diseases.

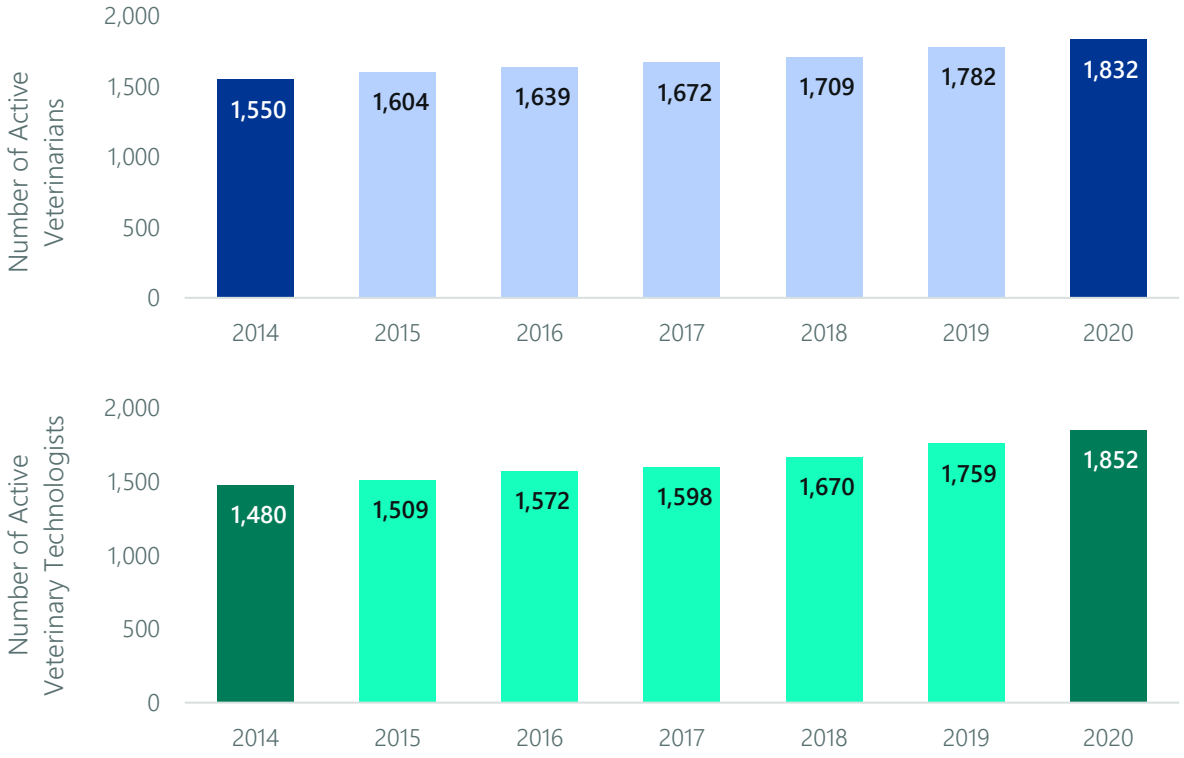
2.3 Veterinary Professionals in Alberta



Veterinarians are responsible for the overall care and treatment of the animals and are supported by veterinary technologists who also play an integral part in the provision of veterinary medical services. Veterinary technologists assist veterinarians in treatment and management of animals by performing laboratory tests, filling prescriptions, preparing animals for surgery, monitoring anesthesia, assisting in surgical operations, monitoring progress, administering treatments, performing certain dental procedures and taking diagnostic images.

As shown in Figure 1, between 2014 and 2020 the number of active veterinarians in Alberta grew from 1,550 to 1,832 (approximately three percent annually) and the number of veterinary technologists grew from 1,480 to 1,852 (approximately five percent annually).

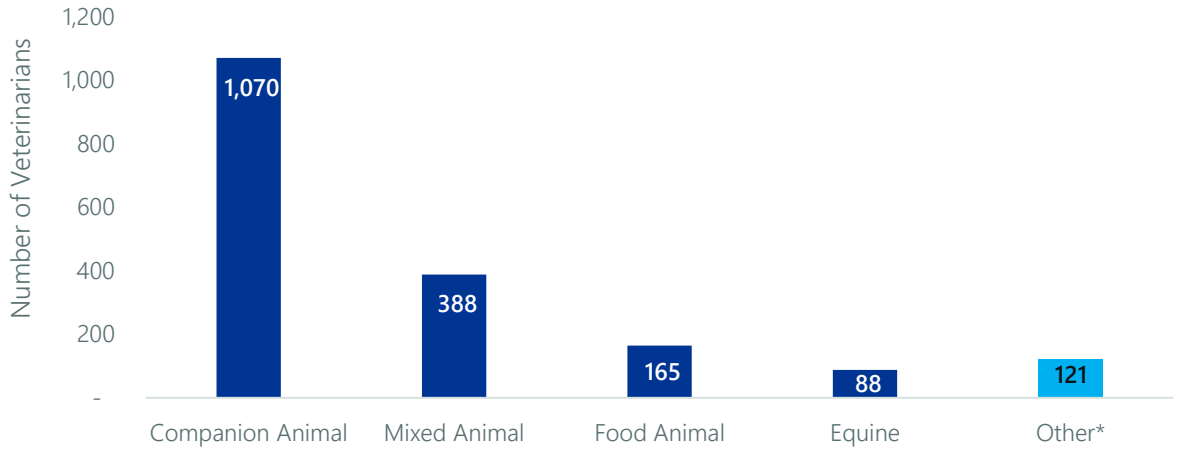
Figure 1: Number of Active Veterinarians and Veterinary Technologists – 2014 to 2020



Source: ABVMA, Annual Report – 2014 to 2020

Figure 2 shows the distribution of veterinarians by practice type in 2020. The majority of veterinarians work in Companion Animal practices (58 percent) followed by Mixed Animal practices (21 percent), Food Animal practices (9 percent) and Equine practices and other settings.

Figure 2: Number of Veterinarians by Practice Type - 2020

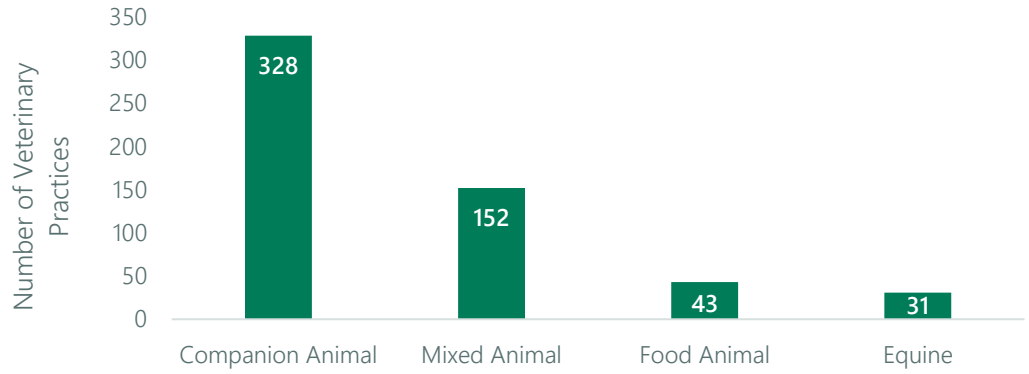


*Note: Other includes veterinarians that work in educational/research, government, exotic/wildlife/zoo animal, consulting, laboratory animal, and regulatory fields.

Source: ABVMA, Annual Report - 2020

In 2020, there were 554 veterinary practices in Alberta.[12] Figure 3 shows the breakdown of veterinary practices by type. Companion Animal practices accounted for the largest number of practices (59 percent), followed by Mixed Animal practices (27 percent). Food Animal and Equine practices accounted for eight percent and six percent of all veterinary practices respectively.

Figure 3: Number of Veterinary Practices by Type - 2020

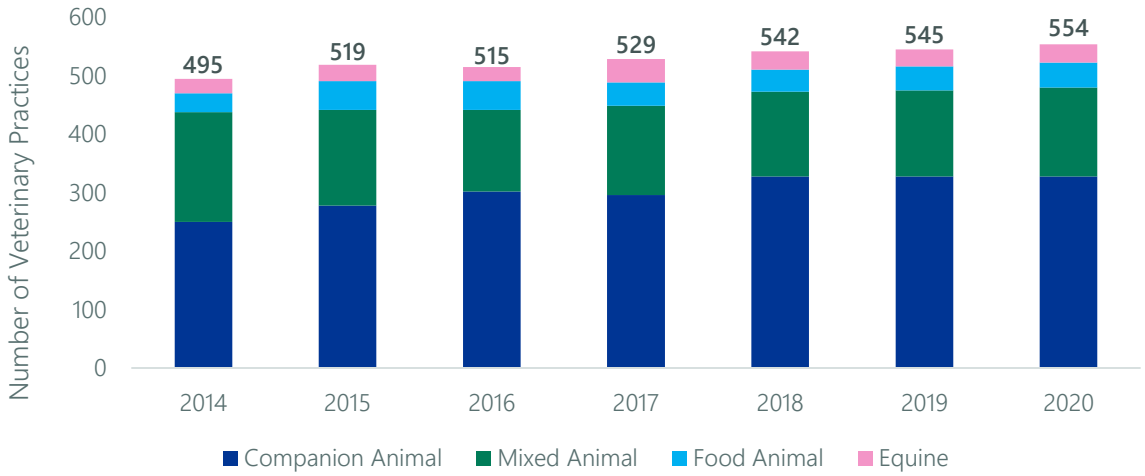


Source: ABVMA, Annual Report - 2020

As shown in Figure 4, the number of veterinary practices in Alberta grew by 12 percent from 495 to 554 between 2014 and 2020.

[12] The definition of veterinary practice encompasses organizations categorized as Companion Animal, Mixed Animal, Food Animal, and Equine practices and excludes Zoo/Wildlife, Education, and other practices.

Figure 4: Number of Veterinary Practices – 2014 to 2020

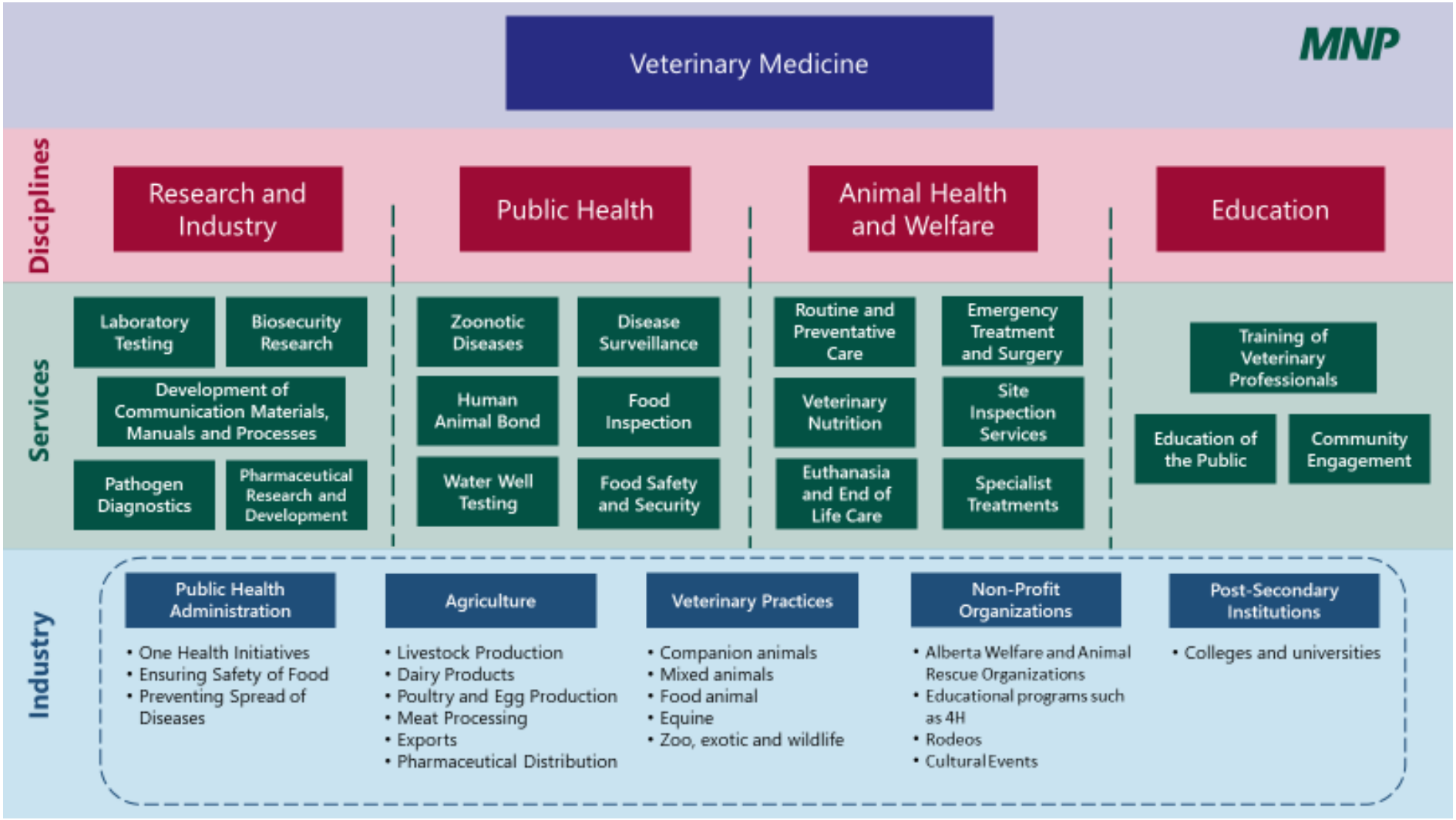


Source: ABVMA, Annual Report – 2014 to 2020

2.4 Value Chain and Other Industries Supported

As shown in Figure 5: Value Chain of Alberta's Veterinary Medicine, veterinary medicine contributes to Alberta's economy through the value chain linkages and the support that they provide to the other industries.

Figure 5: Value Chain of Alberta's Veterinary Medicine



3. Economic Impact Methodology

In general, economic impacts are viewed as being restricted to quantitative, well-established measures of economic activity. The most commonly used of these measures are output, GDP, employment and government revenue:

- Output is the total gross value of goods and services produced by a given company or industry measured by the price paid to the producer. This is the broadest measure of economic activity.
- Gross Domestic Product ("GDP"), or value added, refers to the additional value of a good or service over the cost of inputs used to produce it from the previous stage of production. Thus, GDP is equal to the unduplicated value of the goods and services produced.
- Employment is the number of additional jobs created. Employment is measured in terms of full-time equivalents ("FTEs"). One FTE is equivalent to one person working full-time for one year or one person-year of employment.
- Government Revenues are the total amount of revenues generated for different levels of government. Revenues arise from personal income taxes, indirect taxes less subsidies, corporate income taxes, taxes on products and royalties. Please note that because tax revenues can frequently change due to modifications in tax policy, the government revenues in this report are estimates only and subject to change. They should be viewed as approximate in nature.

Economic impacts may be estimated at the direct, indirect and induced levels:

- Direct impacts are due to changes that occur in "front-end" businesses that would initially receive expenditures and operating revenue as a direct consequence of the operations and activities of an industry, organization or project.
- Indirect impacts arise from changes in activity for suppliers of the "front-end" businesses.
- Induced impacts arise from shifts in spending on goods and services as a consequence of changes to the payroll of the directly and indirectly affected businesses.

To estimate the economic impacts generated by veterinary professionals, MNP employed an input-output methodology using provincial economic multipliers for Alberta published by Statistics Canada. Input-output modeling is a widely used and widely-accepted approach, making it recognizable by many different stakeholders and audiences. The structure of the approach also facilitates easy comparisons between reported results for different industries and organizations.

A detailed description of our methodology and assumptions are provided in Appendix A.

Data for the economic impact modelling was obtained from the Canadian Veterinary Medical Association's (CVMA) economic survey of veterinary practices and the ABVMA's annual reports.

4. Economic Impacts

To demonstrate the economic contribution of veterinary medicine, MNP estimated the economic impacts associated with the operation of veterinary practices as well as economic contribution of veterinary professionals working in other sectors.

4.1 Economic Impacts of Veterinary Practices

The day-to-day operations of veterinary practices generate economic impacts in Alberta through expenditures on goods and services, the employment of staff, and the generation of tax revenues for different levels of government.

To estimate the revenues and expenditures of veterinary practices in Alberta MNP used data on practice revenues and expenditures per FTE veterinarian from the 2020 CVMA economic survey and the number of FTE veterinarians working in veterinary practices in Alberta in 2020.[13] Veterinary practices in Alberta were estimated to have approximately $1.1 billion in total revenues in 2020. As shown in Table 1, approximately 60 percent of this revenue was estimated to be generated from the provision of professional services and 40 percent was generated from sales of drugs and animal food.

Table 1: Revenues of Veterinary Practices in Alberta – 2020

	Companion Animal	Mixed Animal, Food Animal, and Equine	Total
Total Number of Practices	**328**	**226**	**554**
Total Estimated Revenues ($ million)	**$736**	**$398**	**$1,134**
Share of Revenues from Professional Services	61%	57%	60%
Share of Revenues from Food and Drug Sales	39%	43%	40%

Source: Canadian Veterinary Medical Association, Economic Report - 2020

As shown in Table 2, veterinary practices in Alberta were estimated to have total spending of approximately $926 million in 2020. Drugs and supplies accounted for the largest share of these expenditures (39 percent) followed by wages paid to associate veterinarians, veterinary technologists and other practice staff (38 percent). Other operating expenditures, including rent and office expenditures and laboratory expenses, accounted for approximately 23 percent of practice spending.

[13] Veterinary practices were estimated to generate between $530,000 to $680,000 in revenues per full-time equivalent (FTE) veterinarian and had expenditures between $440,000 to $550,000 per FTE veterinarian in 2020 depending on the type of practice. CVMA's economic surveys define a Full-Time Equivalent (FTE) veterinarian as a veterinarian working 1,750 hours annually. Practice wide estimates of revenues and expenditures were developed using total number of veterinarians and mean/median annual hours worked.

Table 2: Expenditures by Veterinary Practices in Alberta – 2020

	Companion Animal	Mixed Animal, Food Animal, and Equine	Total
Total Estimated Expenditures ($ million)	**$596**	**$330**	**$926**
Drugs and Supplies	37%	48%	39%
Wages (Associate Veterinarians and Other Staff)	42%	32%	38%
Rent and Office Expenditures	9%	6%	8%
Laboratory	4%	1%	3%
Other Operating Expenditures	8%	13%	12%

Source: Canadian Veterinary Medical Association, Economic Report - 2020

Table 3 shows the estimated annual economic impacts generated by veterinary practices in Alberta in 2020. The total estimated impacts at the direct, indirect and induced level include:

- Approximately $2.0 billion in total provincial output, including direct output of $1.1 billion, indirect and induced output of $544 million and $343 million respectively.
- Approximately $1.1 billion in provincial GDP, including direct GDP of $582 million, indirect GDP of $279 million, and $214 million in induced GDP.
- Approximately 10,000 total full-time equivalent (FTE) jobs in Alberta, including direct employment of over 6,600 FTEs, indirect employment of 2,000 FTEs, and induced employment of 1,600 FTEs.
- Approximately $113 million in total federal government tax revenue, $76 million in total provincial tax revenue, and $17 million in total municipal tax revenue.

Table 3: Economic Impacts of Veterinary Practices in Alberta – 2020

	Output ($ million)	GDP ($ million)	Employment (FTEs)	Federal Taxes ($ million)	Provincial Taxes ($ million)	Municipal Taxes ($ million)
Direct	$1,134	$582	6,611[14]	$56	$33	$0.1
Indirect	$544	$279	2,000	$26	$18	$7
Induced	$343	$214	1,600	$31	$25	$10
Total	**$2,021**	**$1,075**	**10,211**	**$113**	**$76**	**$17**

[14] Direct employment includes veterinarians, veterinary technologists and other practice staff. The number of veterinarians and veterinary technologists are based on registration data provided by the ABVMA. The number of other practice staff were estimated based on a full-time veterinarian working 1,750 hours per year and the ratio of hours of support staff for each hour of a veterinarians time from the Canadian Veterinary Medical Association Economic Report for Alberta 2020. The total hours of support staff time were converted to FTEs based on annual hours per FTE of 1,920.

5. Types and Occupation of Jobs Created by Veterinary Practices

As shown in Table 3, veterinary practices directly created 6,611[15] full-time equivalent jobs in 2020. Of these total direct jobs, 590 were veterinarians who are also practice owners, 1,121 were associate veterinarians employed in the practices, and approximately 4,900 were veterinary technologists and other practice staff. Approximately, 62 percent of the jobs in a practice, excluding the practice owner(s), are skilled positions requiring post-secondary credentials, professional certification or significant experience, and 40 percent are semi-skilled which typically require high-school completion and vocational training or job-specific courses. The remaining five percent are unskilled positions for which on-the-job training or workplace instruction is all that is typically required. Table 4 shows the types of jobs created by veterinary practices.

[15] Direct employment includes veterinarians, veterinary technologists and other practice staff.

Table 4: Types and Occupation of Jobs Created by Veterinary Practices

	CATEGORY	DESCRIPTION	OCCUPATIONS	WAGE RANGE	SHARE OF WORKFORCE
SKILLED	Associate Veterinarians	Associate veterinarians typically work full-time or part-time as employees in veterinary clinics instead of owning their own practice. Becoming a veterinarian requires graduation from an AVMA COE Doctor of Veterinary Medicine program and successful completion of the North American Veterinary Licensing Exam.	• Veterinarian	$41 - $63	20%
	Technologists	Becoming a registered veterinary technologist requires graduation from a CVMA accredited college technology program, typically a 2- or 3-year diploma program, and successful completion of the Veterinary Technician National Examination.	• Registered Veterinary Technologist	$21 - $27	31%
	Management	Education requirements are typically a Bachelor's degree or above and significant experience in the relevant field. In some cases, professional certification may be required.	• Office Manager • Veterinary Practice Manager • Veterinary Hospital Administrator	$28 - $37	11%
SEMI-SKILLED	Administrative and Clerical	The education and training requirements for these occupations vary from a high school diploma to a post-secondary certificate or diploma.	• Receptionist • Non-Registered Assistant • Kennel Assistant • Groomer	$16 - $23	34%
UNSKILLED	Other Occupations	Occupations in this group typically provide on job training and do not require formal education, however, some experience may be required.	• Kennel Assistant • Groomer	$15 - $16	4%

Source: Canadian Veterinary Medical Association, Economic Report – 2020 and Canadian Veterinary Medical Association, Alberta Non-DVM Wage Report - 2020.

5.1 Economic Contributions of Veterinarians Employed in Government, Industry and Academia

In addition to veterinarians working at and managing veterinary practices, veterinarians are also employed by other sectors. This includes veterinarians working in government, educational institutes, laboratories, government institutes, industrial and pharmaceuticals sectors, as well as consulting businesses and non-profit organizations. The work of these veterinarians contributes to the Alberta economy through the activities of the organizations for which they work and through their household spending.

In 2020 there were approximately 121 veterinarians employed in these sectors who were estimated to earn approximately $16.1 million.

The household spending of these veterinarians was estimated to generate approximately:

- $11 million in provincial output.
- $7 million in provincial GDP.
- 60 FTE jobs.
- $2 million in taxes for all three levels of government.

5.2 Comparison with Other Industries

To provide perspective on the size of the economic impacts of veterinary medicine in Alberta, it is useful to compare the impacts with those created by other industries and sectors. The following are comparisons of the profession's impacts with the new home construction industry, crop and animal production, health care sector and tourism spending in Alberta.

- New home construction: The direct and indirect jobs supported by veterinary practices (8,611 FTEs) are roughly equivalent to the employment supported by the construction of 3,600 new homes in Alberta.[16] This represents approximately 15 percent of the total new homes constructed in Alberta in 2020.[17]
- Crop and animal production: The crop and animal production industry contributed approximately $4.5 billion to Alberta's GDP in 2018.[18] The direct GDP generated from the

[16] Canadian Home Builders' Association, Economic Impacts of New Home Construction. Available here: https://www.chba.ca/impacts

[17] There were approximately 24,000 housing starts in Alberta in 2020. Source: Canadian Home Builders' Association, Economic Impacts of New Home Construction. Available here: https://www.chba.ca/impacts

[18] Statistics Canada. Table: 36-10-0402-01. Gross domestic product (GDP) at basic prices, by industry, provinces and territories, growth rates (x 1,000,000)

operation of veterinary practices ($582 million) was estimated to be equivalent to approximately 13 percent of the GDP contribution of the crop and animal production industry.

- Health care: Alberta's health care sector contributed approximately $19 billion to the provincial GDP in 2018. The direct GDP generated from the operations of veterinary practices ($582 million) was estimated to be equivalent to approximately 3 percent of the GDP contribution of the health care sector.
- Tourism: The tourism spending in Alberta contributed approximately $3.5 billion to Alberta's GDP in 2019.[19] The direct GDP generated from the operation of veterinary practices ($582 million) was estimated to be equivalent to approximately 17 percent of the GDP contribution of tourism spending.

It is important to note that the veterinary medicine industry offers long-term, stable employment whereas employment in the construction and tourism industries may be project based or seasonal.

[19] Alberta Jobs, Economy and Innovation (Statistics Canada, Visitor Spending Model for Alberta – 2019 numbers). Available here https://industry.travelalberta.com/visitor-market-insight/tourism-indicators/alberta-tourism-indicators.

6. Case Studies

In addition to creating economic impacts for the province, veterinary medicine provides significant contributions to support communities and protect animal health and welfare and support animal owners. For example, the COVID-19 pandemic has created a lot of uncertainty and added stress for people, many of whom have adopted a pet to help their mental health during lockdown.[20] Since March 2020 the share of Canadians with a pet in their household has risen by approximately 9 percentage points to close to 50 percent.[21]

By providing care for companion animals, veterinary professionals indirectly contribute to maintaining and improving mental health. Pets can provide a variety of health benefits to people including relieving depression and anxiety, lowering stress, and improving overall mental health. According to a survey conducted by the Human Animal Bond Research Institute, 97 percent of doctors believed there were health benefits that resulted from owning a pet and 78 percent of physicians reported seeing one or more of their patients' overall health improve.[22] Furthermore, scientific evidence has revealed that service dogs can help alleviate symptoms in veterans with post-traumatic stress disorder and lower levels of depression.[23]

When examining and treating companion animals, veterinary professionals also have a role in educating pet owners about humane animal care. In some instances, veterinary professionals have a duty to address suspected animal abuse. Since there is a strong correlation between intentional animal abuse and violence towards people, veterinary professionals play an important role in helping identify and reporting potential victims of abuse in conjunction with animal abuse.[24]

The following case studies highlight specific contributions that veterinary medicine provides and the role that veterinary professionals play in supporting rural communities, disease monitoring and public health, and food safety and food security in Alberta. Information used to prepare the case studies was obtained through secondary research and interviews with subject matter experts.

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[20] World Economic Forum, This is how Pets Helped Our Mental Health During Lockdown. October 2021. Available here: https://www.weforum.org/agenda/2021/10/pet-dog-cat-mental-health-lockdown/

[21] Narrative Research, Canada Has Seen a Significant Increase in Pet Owners Since the Start of the COVID-19 Pandemic. November 2020. Available here: https://narrativeresearch.ca/canada-has-seen-a-significant-increase-in-pet-owners-since-the-start-of-the-covid-19-pandemic/

[22] Human Animal Bond Research Institute, Family Physician Survey – Pets and Health. 2014. Available here: https://habri.org/2014-physician-survey

[23] Mental Health America, How Science Supports Pets for Improving Your Mental Health. Available here: https://mhanational.org/blog/how-science-supports-pets-improving-your-mental-health

[24] Canadian Veterinary Medical Association, Responsibility of Veterinary Professionals in Addressing Animal Abuse and Neglect – Position Statement. February 2018. Available here: https://www.canadianveterinarians.net/documents/responsibility-of-veterinary-professionals-in-addressing-animal-abuse-and-neglect-position-statement

CASE STUDY

Alberta's Rural Areas

Backdrop

Rural Alberta provides significant economic contributions to the province through a range of industries. Agriculture, energy, forestry and numerous other sectors support growing rural communities that require reliable services for residents and for industry. In 2020, Alberta's agriculture industry employed approximately 42,500 people and contributed over $6 billion to Canada's GDP.[25] Veterinary practices in rural Alberta are an important example of necessary services provided to local residents and businesses. Agriculture and livestock operations, both large and small, depend on local veterinary services for disease prevention, urgent care, and overall herd health. Local veterinarians also provide care for companion animals and allow rural Albertans to access services right in their own communities.

Impact of Veterinary Medicine in Rural Areas

Rural animal welfare is dependent on the availability of local veterinary professionals and services.[26] These services are necessary to provide preventive and emergency care for rural residents' pets as well as livestock and food animals throughout their life cycle. Veterinarians also play important roles in providing education and nutritional advice for animal owners to ensure their health and safety.

Without local, accessible veterinary practices, rural Albertans are often required to travel for veterinary services. In some instances, this may take several hours. In emergency situations, the time required to reach a larger centre or the nearest veterinary clinic, or have a veterinarian travel to a remote location for livestock animals, may severely impact the welfare of an animal.

While telemedicine is a growing field and can give farmers access to veterinary services remotely, it has a number of limitations. Fast and reliable broadband internet is not available in many places and services such as calving require in-person care.

"Local practices are the gateway for humane treatment of animals in rural areas."

- Dr. Ian Goodbrand

In some circumstances if a veterinarian is unable to reach a location fast enough, the only option may be euthanasia for the affected animal.[27]

[25] Government of Alberta, 2020 Agriculture Statistics Factsheet. August 2021. Available here: https://open.alberta.ca/dataset/79f01912-5e5c-469e-8cf4-97cfc6901cea/resource/745669c0-cba5-449d-b1a3-0402fa015d8c/download/af-itrb-agriculture-statistics-factsheet-2020.pdf

[26] MNP interview findings.

[27] Ibid.

Economic Contributions to Rural Areas

As agriculture is one of the key industries in rural Alberta, veterinary care and support for the agriculture industy is crucial to the economic stability of the region. In particular, large livestock farms are significantly more difficult to sustain without local and accessible veterinary services.

Veterinary practices also provide a stable source of reliable and high paying jobs in rural areas.[28] Dr. Ian Goodbrand, owner of the Border Veterinary Clinic in Provost, employs 20 people in the area. Their income is invested back into the community through homeownership, household spending, and tax revenue. His staff are leaders in their communities who are involved in local organizations including 4H clubs, agricultural societies, and youth organizations. They also mentor local children interested in becoming a veterinary professional and are often involved in the arts in the community.

> *"Veterinary practices are foundational pillars, both socially and economically, in rural Alberta. They should be treated as an essential service."*
>
> *- Rural Municipalities of Alberta President Paul McLauchlin*

[28] MNP interview findings.

CASE STUDY

Disease Monitoring and Public Health

Backdrop

Many people interact with animals on a daily basis for a variety of reasons ranging from companionship to food production, food safety and food security. Global trends such as population growth, a shift towards urbanization and intensification of the livestock industry result in common interactions between people and animals, creating an environment for infectious diseases to spread between animals and humans.[29] According to the Centers for Disease Control and Prevention, zoonotic disease represents approximately 75 percent of all emerging pathogens and roughly 60 percent of over 1,400 human pathogens.[30]

> Zoonotic diseases are infectious diseases that can be spread between animals and humans; can be spread by food, water, fomites, or vectors.
>
> *Source: A Tripartite Guide to Addressing Zoonotic Diseases in Countries, Food and Agriculture Organization of the United Nations*

Impact of Veterinary Medicine on Disease Monitoring and Public Health

Veterinary professionals play an important role in identifying, monitoring, treating and preventing diseases in animals as well as people. In addition to performing routine health examinations and maintaining immunization practices to detect and prevent illness, veterinary professionals are also essential in helping prevent disease outbreaks in animal populations. Veterinary professionals reduce the risk of disease pathogens from emerging and spreading by proactively implementing biosecurity and parasite control programs, helping identify and advise on the risks of disease in animals, and diagnosing, investigating, and helping control zoonotic diseases that affect public health.[31]

Veterinary professionals working in the private and public sector work with industry at various points in the supply chain to help maintain the health of food producing animals. Veterinary professionals also create biosecurity plans to prevent the introduction and spread of disease pathogens between animals and humans. Activities include:[32]

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[29] Food and Agriculture Organization of the United Nations, Managing Diseases in Animals to Prevent Health Crisis in Humans. 2021. Available here: https://www.fao.org/3/cb6593en/cb6593en.pdf

[30] Centers for Disease Control and Prevention, Veterinary Safety & Health: Biological Safety. March 2018. Available here: https://www.cdc.gov/niosh/topics/veterinary/biological.html

[31] Merck & Co., Veterinary Manual – Role of Veterinarian in Public Health/One Health. June 2016. Available here: https://www.merckvetmanual.com/public-health/public-health-primer/role-of-the-veterinarian-in-public-health-one-health

[32] MNP interview findings.

- Developing and managing government programs, policies and regulations.
- Providing guidance to livestock producers to understand and mitigate biosecurity risks.
- Collection and analysis of samples from livestock producers.
- Monitoring the health of food animals.
- Inspection of meat processing facilities.

Biosecurity refers to practices designed to prevent, reduce or eliminate the introduction and spread of disease.

Source: Government of Alberta, Biosecurity and Livestock - Overview

Veterinary professionals are an integral part of One Health – an approach that recognizes the importance of animal, human and environmental health to combat infectious diseases.[33] Proper treatment of manure and infected animals is extremely important to prevent spread of disease. If improperly managed, disease pathogens could contaminate our soil and water supply, spreading to a new population of animals or non-animal food sources.[34]

Disease Surveillance

When it comes to disease management, an effective surveillance system is a critical first step in controlling the rate of infection. Since veterinary professionals are in the field, they are often the first line of defense. Furthermore, veterinary professionals are trained across several species and may recognize and detect disease pathogens in humans that medical doctors may not be attune to.[35] An example of this is the case of a child who was brought to a local emergency department with symptoms of cough and fever in October 2020. With the use of existing disease pathogen databases compiled in part, with submissions from veterinary researchers, test results confirmed that it was influenza A of swine origin. A joint investigation between university partners, public health officials, and veterinary public health, which involved both private practitioners and government veterinarians, conducted on farm investigations that ultimately found the likely source of origin.[36] The quick response between human and veterinary public health practitioners enabled a rapid response to a potential outbreak and ensured no further spread occurred.[37]

"Veterinarians are important partners in developing and implementing effective biosecurity programs to protect animal health and improve food safety."

- Dr. Hussein Keshwani, Public Health Veterinarian

[33] Centers for Disease Control and Prevention, One Health Basics. November 2018. Available here: https://www.cdc.gov/onehealth/basics/index.html

[34] MNP interview findings.

[35] Ibid.

[36] Ibid.

[37] Centers for Disease Control and Prevention - Emerging Infectious Diseases, Characterization of Swine Influenza A(H1N2) Variant, Alberta, Canada, 2020. December 2021. Available here: https://wwwnc.cdc.gov/eid/article/27/12/21-0298_article

In addition to their important role in the rapid detection of disease and the identification of the origin, veterinary professionals play a role in developing solutions to control disease pathogens from spreading.[38] The potential impact of spread includes both significant economic impacts, as well as loss of life as illustrated by the following diseases of zoonotic origin that have emerged since 2000: [39]

- SARS - severe acute respiratory syndrome.
- H5N1 - avian influenza.
- H1N1 - pandemic influenza (swine origin).
- COVID-19 – coronavirus.

While it is impossible to estimate the total negative impacts avoided through the prevention of animal disease outbreak, the benefits of effective surveillance programs and management of such diseases to minimizing spread extends far beyond the protection of public health. The impact of large-scale outbreaks creates implications for the livestock sector, meat and animal feed manufacturers, as well as a range of service sectors including trucking, sales yards and brokers.[40]

"It is a great challenge to demonstrate the value that public sector veterinary medicine plays because so much of our efforts are for prevention and preparedness to prevent foreign animal disease from happening in the first place. Without the work that we do, we would be in much greater risk."

- Dr. Keith Lehman, Alberta Chief Provincial Veterinarian

[38] MNP interview findings.

[39] Food and Agriculture Organization of the United Nations, Managing Diseases in Animals to Prevent Health Crisis in Humans. 2021. Available here: https://www.fao.org/3/cb6593en/cb6593en.pdf

[40] Statistics Canada Research Paper. Canada's Beef Cattle Sector and the Impact of BSE on Farm Family Income 2000 – 2003. June 2004. Available here: https://www150.statcan.gc.ca/n1/pub/21-601-m/21-601-m2004069-eng.pdf

CASE STUDY

Food Safety and Food Security

Backdrop

Veterinary medicine plays an important role in food safety in Alberta and across Canada, contributing to overall local and global food security. Veterinary professionals ensure the health and safety of the animals raised throughout their life cycle up until processing, which is a veterinary-led process and approved through the Canadian Food Inspection Agency ("CFIA").

It is not common knowledge that veterinary professionals and veterinary medicine plays a role in food safety and food security beyond livestock and confined feeding operations. One such example is their involvement in beekeeping, which is a critical component in the pollination process for hybrid canola seed and fruits and vegetables.

Impact of Veterinary Medicine on Food Safety and Food Security

One of veterinary medicine's contributions to food safety and food security in Canada is passive disease surveillance (as discussed in the case study "Disease Monitoring and Public Health").[41]

Canada is one of the leading exporters of meat in the world, exporting $7.6 billion of meat across the globe in 2019 - with Alberta accounting for $2.9 billion of that.[42] Canada also exported $1.2 billion of live animals, with Alberta contributing almost half of that at $742 million dollars.[43]

Veterinary professionals ensure that exported products are safe and meet the requirements of World Trade Organization's Sanitary and Phytosanitary Measures Agreement, which are critical to maintaining access to export markets.[44]

Cattle Production in Alberta

The majority of meat and livestock exported from Alberta is derived from cattle. Alberta's cattle industry employs 23,300 Albertans, accounting for one percent of all employed Albertans.

Source: Statistics Canada

[41] MNP interview findings.

[42] Government of Canada, Trade Data Online - "meat and edible meat offal". December 14, 2021. Available here: https://www.ic.gc.ca/app/scr/tdst/tdo/crtr.html?grouped=GROUPED&searchType=BL&naArea=P48&countryList=ALL&toFromCountry=CDN&reportType=TE&customYears=2019&timePeriod=%7CCustom+Years&currency=CDN&productType=HS6&hSelectedCodes=%7C2&runReport=true

[43] Government of Canada, Trade Data Online – "live cattle and bovine". December 14, 2021. Available here: https https://www.ic.gc.ca/app/scr/tdst/tdo/crtr.html?grouped=GROUPED&searchType=KS_CS&naArea=9999&countryList=ALL&toFromCountry=CDN&reportType=TE&customYears=2019&timePeriod=%7CCustom+Years&currency=CDN&productType=HS6&hSelectedCodes=%7C10210%7C10221%7C10229&runReport=true

[44] World Trade Organization, Understanding the WTO Agreement on Sanitary and Phytosanitary Measures. May 1998. Available here: https://www.wto.org/english/tratop_e/sps_e/spsund_e.htm

Any type of major outbreak would typically cause other countries to temporarily halt imports of products and negatively impact Canada's reputation as a reliable source for export markets. For context, in 2004, the total economic impact on the Canadian livestock and cow-calf sector from the BSE (mad cow disease) outbreak was estimated at $6.3 billion.[45]

"Veterinarians have the responsibility to notify federal and provincial authorities about detected diseases in livestock. Playing this role keeps our food and food industry safe and ensures market protection."

- Dr. Natasha Kutryk of Feedlot Health Management Services by Telus Agriculture

Veterinary professionals working for the CFIA are crucial for ensuring the safety of food entering the market.[46] Industry relies on veterinarians to be part of the inspection process, and it impacts their businesses if they cannot have their products properly inspected.

Another example of the veterinary professionals' role in food safety and food security is in relation to the use of antimicrobials. In 2018, Health Canada instituted legislation requiring veterinary oversight of all medically important antimicrobials and that antimicrobials be sold by prescription only to preserve effectiveness, limit overuse and minimize spread of antimicrobial resistance (AMR).[47] Prior to 2018, drugs containing these antimicrobials were available over the counter, leading Health Canada to declare that AMR was a risk to public health.

This veterinary oversight is important to honeybee health, as an example, and in turn food production and food security. Through pollination and honey production, Canada's honey bee population is estimated to contribute between $4 billion and $5.5 billion to the economy.[48] According to guidelines published by the Food and Agriculture Organization of the United Nations, honeybees can contract a variety of infectious diseases that pose different levels of risk to colony health, and the use of antimicrobials to treat them should be prudent to slow AMR in honeybees.[49]

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[45] Statistics Canada Research Paper. Canada's Beef Cattle Sector and the Impact of BSE on Farm Family Income 2000 – 2003. June 2004. Available here: https://www150.statcan.gc.ca/n1/pub/21-601-m/21-601-m2004069-eng.pdf

[46] MNP interview findings.

[47] Health Canada, Responsible use of Medically Important Antimicrobials in Animals. September 3, 2021. Available here: https://www.canada.ca/en/public-health/services/antibiotic-antimicrobial-resistance/animals/actions/responsible-use-antimicrobials.html

[48] Government of Canada Statistical Overview of Canadian Honey and Honey Bee Industry, 2019. Available here: https://agriculture.canada.ca/en/canadas-agriculture-sectors/horticulture/horticulture-sector-reports/statistical-overview-canadian-honey-and-bee-industry-2019

[49] Food and Agriculture Organization of the United Nations - Responsible Use of Antimicrobials in Beekeeping. Available here: https://www.fao.org/3/cb6918en/cb6918en.pdf

Other roles played by veterinary professionals in supporting food safety and security include:

- Influencing how people perceive agriculture and livestock operations.[50] Veterinary professionals contribute by advocating for animal welfare in livestock, and ensuring that meat is safe for consumption. This is important from a marketing and public communiciations perspective.
- An advisory role in financial stability for farms by identifying unproductive animals.[51] Financially stable farms invest more in the community, employ local people and provide more foods for Canadians and our trading partners.
- Supporting disaster relief by providing care for affected animals. This was illustrated in the response to the November 2021 floods in B.C.[52] Veterinary professionals were in urgent demand to provide care for animal welfare and to prevent euthanisia when required. They also helped local farms return to normal production to provide food across B.C. and Canada.

> *"Control of diseases of concern are critical to the industry to keep market access, both import and export."*
>
> *- Dr. Troy Bourque of the Canadian Food Inspection Agency*

When thinking about food safety and food security in Alberta and across the world, the numerous roles that veterinary professionals play are critical to the success of the industry and protection of human health. The welfare of animals throughout food production processes are of the utmost importance and would not be possible without the work of veterinary professionals.

[50] MNP interview findings.

[51] Ibid.

[52] Global News, Thousands of animals have died in B.C. floods, thousands more need help: minister. November 17, 2021. Available here: https://globalnews.ca/news/8381409/thousands-animals-died-bc-floods-euthanized-help/

APPENDIX A – ECONOMIC IMPACT METHODOLOGY

MNP's approach to economic impact modelling is based on published Statistics Canada multipliers and input-output modelling. A step-by-step overview of our approach to estimating the economic impacts is provided below.

Step 1: Collected Information on Revenues, Expenditures and Employment for Veterinary Practices

Step 2: Applied Statistics Canada's Input-Output Multipliers to Estimate Economic Impacts

Step 3: Made Appropriate Adjustments to the Economic Impacts

Step 1: Collected Information on Revenue, Expenditures and Employment for Veterinary Practices

MNP collected information on revenues, expenditures on employment from the Canadian Veterinary Medical Association's (CVMA) economic survey of veterinary practices. The survey provides estimates per Full-Time Equivalent (FTE) veterinarian working 1,750 hours annually. Practice wide estimates were developed using total number of active veterinarians and mean/median annual hours worked.

Step 2: Applied Statistics Canada's Input-Output Multipliers to Estimate Economic Impacts

Statistics Canada's 2017 input-output multipliers for Alberta were then applied on revenues to estimate the economic impacts of operations of veterinary practices. The expenditure profiles collected in Step 1 were compared with Statistics Canada Supply and Use tables[53] to identify the relevant industry multipliers to be applied.

Step 3: Made Appropriate Adjustments to the Economic Impacts

The information collected in Step 1 was then compared with the estimates generated by the multipliers such as wages and salaries, and employment. Based on the comparisons, appropriate adjustments were then made to the estimated economic impacts.

[53] The Supply and Use Tables show the goods and services used by each industry in the production of their goods and services along with the costs of primary inputs used in production.

APPENDIX B – ABOUT MNP

For over 60 years, MNP has proudly served and responded to the needs of clients in the public, private and not-for-profit sectors. Today, MNP is the fifth largest Chartered Professional Accountancy and business consulting firm in Canada and is the only major accounting and business consulting firm with its head office located in Western Canada. MNP has more than 117 locations and over 7,100 team members across the country.

MNP Consulting Services

MNP Consulting provides a broad range of business and advisory services to clients including:

- Strategy Development and Planning
- Stakeholder Engagement
- Performance Measurement
- Economic Analysis
- Research
- Data and Analytics
- Business Plans and Feasibility Studies
- Performance Improvement
- Financial Analysis

About MNP's Economics and Research Practice

Economic and industry studies are carried out by MNP's Economics and Research practice. Based in Vancouver, the Economics and Research practice consists of a team of professionals that has a successful track record of assisting clients with a wide variety of financial and economic impact studies. Our work has encompassed a wide range of programs, industries, company operations and policy initiatives, and has helped clients with decision-making, communication of economic and financial contributions, documentation of the value of initiatives and activities, and development of public policy.