



## Review Article

# Does Veterinary Science have a future in Australia?

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## Introduction

Although the veterinary art has been practiced since antiquity, the modern era began in the 18<sup>th</sup> century with the establishment of the discipline of “Veterinary Science” at universities. In the 19<sup>th</sup> century, veterinary education began in Australia with Kendall’s private veterinary school in 1888 [1]. In 1909, a Veterinary Faculty was established at the University of Melbourne and Kendall’s school was incorporated into it. In 1910, a second faculty was established at the University of Sydney and in 1936, a third was established at the University of Queensland [2-4]. A fourth school was established at Murdoch University in Western Australia (WA) in 1974 [5].

In the first decade of the 21<sup>st</sup> century, three new veterinary schools were established; one at Charles Sturt University (2005), a second at James Cook University (2006) and the third at the University of Adelaide (2008). Australia now has more veterinary schools per capita of any Western Nation [6-8]. In Australia, veterinary science graduates serve in private practice, government service, academia and industry. Those in practice serve the animal-owning public and charge a fee-for-services rendered, whilst the others serve the purpose of the institution employing them and receive a salary for doing so.

Surveys have found that nearly 90% of Australia’s veterinary science graduates enter private practice [9-11]. Most enter dog and cat urban practice, so, the question arises, do we need university courses to produce dog and cat GPs? Can a veterinary service be provided by other means?

Recently, UK academics asked the question “Do we need the professions?” [12]. In this article, I am asking “Do we need the profession of Veterinary Science?” I will prosecute this analysis using the situation in Australia as a case study; firstly, by a literature review and secondly, from research conducted on this subject [13].

## Literature Review

Great Britain established a penal colony on the east coast of *Terra Australis* in 1788, but it was not until 1<sup>st</sup> January 1901, that the British Parliament passed legislation granting the colonies the right to govern as the Commonwealth of Australia (<https://www.australia.gov.au>).

Prior to Federation, there was little need for Veterinary Scientists, because many of those who came to the colony possessed animal skills, such as “horse surgeons, farriers, cow leachers, cattle doctors, castrators, speyers and gelders, charmers, spell workers, butty colliers and water doctors [14,15].”

The first practice established by a veterinary scientist is thought to have been by John Stewart, a graduate of the University of Edinburgh, who began in Sydney in 1841

[15]. During the second half of the 19<sup>th</sup> century, as Australia developed an agricultural economy, the demand for veterinary scientists increased.

Veterinary Faculties were established at the Universities of Melbourne (1909) and Sydney (1910) and the Commonwealth Government passed the *Quarantine Act of 1908* [2,3,16].

In a speech, the inaugural Dean of the Veterinary Faculty at the University of Sydney, stated, “the discipline of veterinary science in Australia was by no means and enviable one for in concrete terms it was financially bad and socially unsatisfactory.” The first major problem facing graduates was competition from non-registered practitioners [17]. By the middle of the 20<sup>th</sup> century, State Veterinary Boards still contained lists of permit holders, that is, non-registered practitioners, in addition to a list of registered Veterinary Surgeons.

During the first half of the 20<sup>th</sup> century, graduates working in institutions, such as government, academia or industry predominated, with private practitioners occupying a minor role and by the middle of the century, there were calls for the nationalisation of the veterinary profession [18,19].

An account of Australia’s veterinary services was published in 2011, in which the author categorised graduates employed in institutions as “Veterinary Scientists” and those in practice as “Veterinary Surgeons”. Further, he stated that from the very beginning conflict existed between the two, who were engaged in a veritable “battle for pre-eminence and prestige” [20].

During the second half of the 20<sup>th</sup> century, the situation reversed with the majority entering private practice and this coincided with the decline in the relative significance of livestock productivity in Australia’s economy [9,10,21].

Prior to Federation, livestock was imported and Australia experienced incursions of disease brought into the country and Fisher [15] concluded that as early as the 1870s, the need for quarantine had become self-evident. State quarantine laws were put in place from 1871 and these were incorporated into the Commonwealth Government’s *Quarantine Act of 1908*. Rinderpest, the scourge of European cattle in the 18<sup>th</sup> century, made an appearance in WA in 1923 and with its eradication, the Division of Veterinary Hygiene was established in the Commonwealth Department of Health. This body operated during most of the 20<sup>th</sup> century [22]. However, outbreaks of exotic diseases occurred during the 20<sup>th</sup> century and a number of enquiries were held to tighten quarantine and ensure retention of Australia’s relatively disease-free status [23,24].

In 2007, due to a breakdown in quarantine of horses introduced to Australia for the Spring Racing Carnival, a Royal Commission was appointed and the *Quarantine Act of 1908* was replaced by the *Biosecurity Act in 2015* [25].

Veterinary education in Australia began with William Tyson Kendall’s Melbourne Veterinary College, who formulated the Victoria *Veterinary Surgeons Act of 1887*, to protect his students [1]. The University of Melbourne incorporated Kendall’s college into a veterinary faculty in 1909, with Sydney establishing a similar faculty in the following year and the University of Queensland establishing at its Brisbane campus in 1936 [4,26,27].

Obstacles hindered the growth of Veterinary Science during the first half of the 20<sup>th</sup> century in Australia, including World Wars I and II, the demise of the horse as a means of transport and the “Great Depression”. By 1950, there were approximately 400 registered Veterinary Scientists in Australia; approximately 50/50 institutions veterinarians and private practitioners [19].

During this time various opinions were expressed regarding the teaching of Veterinary Science [28-30]. As a result, there “was little uniformity, no common curricula, there was conflicting views and each school seemed to be pursuing their own agenda” [13].

State Governments sought to secure agricultural and veterinary graduates and offered cadetships. The graduate was bonded to work for the state in return for having their fees paid. During this era there was no government funding for tertiary education and most university students came from the middle-class [31]. Changes took place in tertiary education in Australia during the second half of the 20<sup>th</sup> century that dramatically altered the landscape. In 1974, the Commonwealth Government abolished university fees and as a result there was a rapid increase in the number of tertiary education student [31]. At this time, the fourth Veterinary School was established in Australia at Murdoch University in Perth [5].

However, the great change, referred to as the “Dawkins Revolution”, took place in 1988, when the then Commonwealth Minister for Employment, Education and Training, the Hon. John Dawkins introduced sweeping reforms [32]. Sixty-five tertiary education institutions – 19 Universities and 46 Colleges of Advanced Education – were transformed into 38 universities. Free education was changed into income contingent loans (HECS) and elite education became mass education, [32]. Universities were changed from places of higher learning to businesses established to meet the demand for higher education.

Not all were happy with these changes and before long questioning of the quality of the graduates under this new regime appeared; for example, disquiet was expressed as to the quality of Veterinary Science graduates [33-36]. At the close of the 20<sup>th</sup> century, voices were raised regarding shortcomings of Australia’s veterinary services, animal quarantine and education and the Federal Government responded by establishing the “Frawley Review” [37]. The Review acknowledged that funding of veterinary schools had reduced whilst cost of providing a veterinary education was rising and this was causing funding shortfalls. Further, veterinary surveillance and monitoring for quarantine was deteriorating and at the time the existing four schools were considered sufficient to meet demand.

The release of the Review brought changes to the existing schools and some consider provided the stimulus for new schools to be developed, for within a few years, three new veterinary schools were established in Australia, taking the number to seven, greatly increasing the number of veterinary graduates being produced. With a population of less than 25 million having seven veterinary schools has made Australia the most intensive producer of veterinary graduates on a per capita basis in the Western World. Resulting from these changes, the veterinary schools of Australia now produced a number of new animal health, handling and productivity courses which has resulted in competition between the schools to attract students. Some schools offer the veterinary degree as a post-graduate qualification and a number have changed from BVSc to DVM. Time will tell if these seven schools are viable.

### Current research

In a recent post-doctoral DVMSc thesis, three aspects of Veterinary Science in Australia were examined, namely, services provided, quarantine and education and results from this research is presented (Maxwell 2018).

**Veterinary services:** An online, 40-question survey was designed and the eight veterinary jurisdictions in Australia were asked to co-operate with distribution to its members. Seven agreed and the survey was posted in 2016.

There were 555 respondents to the survey, which represents a 6% response rate of eligible registered veterinarians within the seven jurisdictions.

Sixty-four percent of respondents were female, 62% were raised in an urban environment and 74% were born in Australia. Fifty-seven percent graduate BVSc, with the balance acquiring alternative veterinary qualifications.

Fifty-eight percent worked full-time and 22% of respondents had taken time-out from their veterinary careers to pursue other activities or to have a family.

Eighty-five percent of respondents provided a clinical service, 9% a government service and the balance researched and/or taught.

Nine percent worked “on farm”, 74% worked in a veterinary clinic or hospital, with the balance working in an institution. The majority provided a clinical service; 97% worked with small animals at the time of graduation and 86% at the time of survey and of those that provided a service to livestock, 73% did so at the time of graduation and 48% at the time of the survey.

Six percent of respondents were dissatisfied with their education, 16% with work performed as a veterinarian, 41% with the income received and 19% with the status achieved in society.

Fifty-four percent of respondents suffered an occupational injury or illness and of these 17% agreed that this impaired their capacity to work and 15% retired as a result.

**Veterinary quarantine:** Oral history interviews were conducted with quarantine personnel. Ten individuals were invited and eight responded.

To the question, “Is quarantine necessary?” all replied that it was, but when asked “Is our present system satisfactory?” there was no unanimity; “Not only is our surveillance and monitoring compromised, the question really is, do we have competent staff to conduct it?”; “Good risk assessment is not in place and I’m not convinced that we have the expertise to assess these different risk.”

On the question of risk, one responded, “Our profession has failed to seize the opportunity offered by risk management”, whilst another stated that, “We are the champions of risk management...our profession should play a major role.”

The main recommendation of the Frawley Review (Frawley 2003) was the establishment of the Australian Veterinary Reserve (AVR) in which 100 private practitioners were to be trained to act in concert with government if an exotic disease entered Australia. In 2007, the AVR was put to the test by an outbreak of Equine Influenza. However, the response was considered a failure and that organisation no longer exists.

The consensus view of participants was, “We are waiting for the next exotic disease incursion and then we will act.”

**Veterinary education:** During 2015 to 2016, oral history interviews were conducted with Deans and Heads of Australia’s Veterinary Schools to establish the impact of the Frawley Review (2003) on veterinary education. One-on-one interviews, lasting from one and a half to two hours, were recorded using a university approved questionnaire protocol.

Twenty-one individuals were invited to participate and 17 accepted the invitation. Sixteen were male, 12 were born in Australia and participants graduated between the 1950s to the 1980s. In answer to the question, “What is the object of a veterinary education?” replies such as “To inculcate within the student an enquiring mind.”; “Veterinary education should be firmly based on science”; “The merit of a veterinary education is to train graduates to solve problems.”; “Our key driver of a veterinary education is to produce one who can go out there and is registerable.”; and, “To produce a graduate who understands the process of diagnosis and therapy” were made.



In answer to the question, “Should veterinary education be confined to the university? The answer was a resounding yes; however, one gave the following response, “No, it shouldn’t be exclusively for universities, which are a conditioned construct that society has got use to...A private provider could enter the veterinary market.” In response to a question regarding government funding of a university veterinary education, some thought that this had changed the very nature of university education. With one exception, all admitted that veterinary schools run at a loss.

To the question, “What changes have you observed in veterinary education?” a variety of replies were received: “A large number of students were bonded to government service when I graduated”; “The main shift I would see would be an increase in focus on practice, particularly small animal practice.”; “Another change is the concept that the lecture is bad.” But the main changes were the female dominance of the profession and the reduction in teaching of livestock in preference for dogs and cats. Opinion varied on the change of the degree from BVSc to DVM.

## Discussion

In the Hammurabi Code of laws established 2,000 years before Jesus Christ, there is reference to the conduct of surgery on an ox and an ass [38]. The veterinary art was practiced in antiquity and has been conducted as a trade since that time until the 18<sup>th</sup> century.

With the advent of the “Scientific Era”, universities introduced the discipline of “Veterinary Science”. Firstly, in France, followed by veterinary schools throughout Europe, Great Britain and the rest of the world.

In Australia, education for a career as a registered veterinary surgeon began 130 years ago. In 1888, a private veterinary school was established by William Tyson Kendall in Melbourne, which in 1909 was absorbed into the Faculty of Veterinary Science at the University of Melbourne [26].

During the first half of the 20<sup>th</sup> century, veterinary graduates opted to enter institutional service, especially government, but that reversed in the second half of the century with the majority entering private practice [19].

Bachelor of Veterinary Science (BVSc) was awarded to Australian graduates with the exception of Murdoch University, which introduced Bachelor of Science, Bachelor of Veterinary Medicine and Surgery (BSc BVMS) [5]. Change took place during the first decade of the 21<sup>st</sup> century with the introduction of the Doctor of Veterinary Medicine degree (DVM), which, in some cases, was awarded as a post-graduate degree [20]. Initially, the major problem facing graduates of the university veterinary schools of Australia was competition with those untrained in Veterinary Science [17]. This conflict lasted well into the 20<sup>th</sup> century. At Katanning, the first rural community in WA, to have a qualified Veterinary Scientists. Jack Filmer (BVSc) established a practice there in 1919, on his return from World War I. However, after he left in 1923, the region was serviced for the next 30 years by permit holders. When I registered with the WA Veterinary Surgeons Board in 1964, there was included a list of permit holders in the Annual Veterinary Register.

The Dawkins’ Revolution changed the nature of universities in Australia. Instead of being centres of higher education they became business, needing to achieve economic goals. It is acknowledged today that veterinary schools operate at a loss [13] and, in the future, these schools may be incorporated into large generic science schools or abandoned altogether.

Already, “Veterinary Science” is being absorbed into broader entities of science at Australia’s universities. Originally, Veterinary Science Faculties and Schools were

established as separate entities within the University of Melbourne (1909), Sydney (1910), Queensland (1936) and Murdoch University (1974). However, today, they have been replaced:

- At the University of Melbourne – Faculty of Veterinary and Agricultural Sciences;
- At the University of Sydney – Faculty of Science;
- At the University of Queensland – Faculty of Natural Resources, Agriculture and Veterinary Science;
- At Murdoch University – School of Veterinary and Life Sciences, Murdoch University;
- Charles Sturt University – School of Animal and Veterinary Sciences;
- James Cook University – College of Public Health, Medical and Veterinary Sciences;
- University of Adelaide – School of Animal and Veterinary Science.

Murdoch University's Provost recently announced that the university was in the process of a major change to create a new academic structure. The proposal is to create two new Colleges for Murdoch University, firstly, The College of Creative Industries, Arts, Business, Law and Education and secondly, the College of Science, Engineering, IT, health and Medicine and under the second will be Veterinary, Animal & Agricultural science.

In 2011, Australia's universities produced 1,221,008 university graduates of which 2,243 (0.2%) were Veterinary Science graduates [39]. These latter, as a proportion of total tertiary student output, were almost irrelevant. In Australia, at present, 85-90% of veterinary graduates enter private practice with the balance occupying positions in government services, academia, industry or activities such as zoo, welfare and animal rescue. By far the majority of Australian veterinary graduating enter private practice and most seek work in urban small animal practice. Government veterinary work focus on livestock disease research, disease control, disease regulation and policy formation. Academicians research animal diseases and the teaching of veterinary science to undergraduates and industry conducted research to promote the company's prosperity. A small number work in areas as diverse as zoological work, marine research, animal welfare, etc.

Veterinary practice in Australia has devolved into general medicine and surgery, primarily in small animal, urban practices, principally by females working part-time. For anything complicated the client is referred to specialist veterinary services. Is a Veterinary Science education required to provide a GP service to small animals? Could individuals, trained in related animals sciences, take on these roles or could the service be provided by empirical on-the-job training as a trade? The history of veterinary service suggests that it could.

Government veterinary services, which in the past, involved livestock disease research, control and policy implementation has contracted to principally a bureaucratic, regulatory function. Could this be performed by others trained in science?

Special government functions such as Quarantine, could be considered a special case, but is it? At present Australia's quarantine system could be characterised as waiting for the next exotic disease incursion to happen. Does this require a Veterinary Science degree? A statement made during the conduct of the recent DVMSc thesis was that, "Veterinary Scientists were not the leaders of quarantine policy, instead they act merely as technicians." Veterinary Education in the past has been conducted by Veterinary Scientists whose prime function was research. All veterinary graduates can recall sitting

through lectures delivered by “boffins” with no aptitude or interest in teaching [35,40]. Teaching any subject should be in the hands of those who want to teach and who have gained expertise in teaching. Being grounded in the narrow discipline of Veterinary Science does not have to be a primary requisite. A well-educated science teacher should suffice for any and all scientific disciplines. The same could apply for the few remaining and peculiar roles such as for zoological work, marine investigation and animal welfare.

Oxford academics have proposed the end of all professions [12], whilst I am proposing the replacement of Veterinary Scientists by others for the decreasing roles presently conducted by

### Veterinary scientists

The profession is devolving into a part-time, female occupation, where for a short period of time a Veterinary Science career is pursued, prior to marriage and raising a family. Males have already made their decision to forgo Veterinary Science as a career, by not enrolling in such university courses.

Could the occupations Veterinary Scientist be performed by others? The author canvassed these issues, in the thesis “Australia’s Veterinarians and the Frawley Review of 2002” [13].

The vast majority of this country’s population, 90 plus percent live in urban Australia and spare little thought for rural Australia; “out of sight, out of mind”. As a result, the needs of rural Australia are of little interest or concern for individuals or major political parties.

### Conclusion

University education in Veterinary Science represents an insignificant proportion of Australia’s higher education output. Today, Australia’s seven university veterinary schools produce graduates that work, almost exclusively, in urban small animal practice. The original justification for providing a veterinary education in Australia was because Australia’s economy depended on agriculture and livestock productivity and the initial provision of a veterinary service to Australia’s livestock producers was seen as a “Public Good”. That is no longer the case. Subsidising veterinary education for small animal practice is not justified. The roles currently performed by graduate Veterinary Scientists, could be performed by other tertiary educated personnel.

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