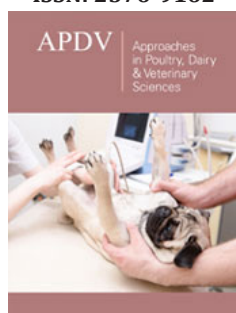


# The Evolution of Equine Dentistry in New Zealand

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## Mini Review

This review examines and documents the evolution of equine dentistry in Aotearoa New Zealand. The versatile horse has been exploited throughout history for various purposes, such as transportation, mechanical capacity, trading, economic and military activities, and leisure and sports [1]. There is evidence of early horse domestication activities that had a tremendous and transformative influence on human lives. The human-horse bond was and still is strong and captivating, whilst being able to intertwine different cultures over the millennia [1]. Since the late 19<sup>th</sup> century, New Zealand represented one of the farthest outlying parts of the British Empire, where equestrian activities such as horse racing formed a significant segment of the principal industries of the time [1]. Prior to the human settlement, New Zealand was effectively devoid of mammals and quite notably browsing mammals. Polynesians settled in (Aotearoa) New Zealand in approximately the 1300s, where the Māori brought Polynesian dog (kurī) and Polynesian rat (kiore). The Dutch explorer Abel Tasman was the first European to sight New Zealand in 1642, and whereby Dutch officials then conferred the name New Zealand on the group of South Pacific islands, which became New Zealand in English [1,2]. The British explorer James Cook was the first European to circumnavigate and map New Zealand in 1769 [2]. Among the various scientific explorations of the South Seas, Cook set free a boar and two sows, the descendants of which continued to thrive today in New Zealand [2]. The Treaty of Waitangi was signed in 1840 by representatives of the British Crown and Māori chiefs that formally established New Zealand as a British colony, after which European settlement substantially expanded [2]. New Zealand's economy was founded on animal products, which continue to be a significant source of international exports [3-5].

In Laing's [6] historical overview on the veterinary profession in New Zealand, J. W. Moorhouse, MRCVS, FEVMS, commenced veterinary practice in the Hutt Valley in 1856, and a very small number of veterinary surgeons were practising in other settlements from that time onwards. Interestingly, in 1843 John Webster set up as a "cattle doctor" in Petone, a new settlement near what would become the capital Wellington. There was no British veterinary degree or diploma before 1866, when the Royal College of Veterinary Surgeons was founded. Prior to this date, certificates of competence to practice veterinary art were granted by the London and Edinburgh Veterinary Colleges [6]. In 1888, J. F. Maclean, MRCVS, was appointed as the Government Veterinarian in the Livestock Branch of the Lands Department as the first full-time government employed veterinarian. In 1893, Dr J. A. Gilruth was employed as New Zealand's first official Government Veterinary (Advisor) surgeon of the newly established Department of Agriculture [2,6-9].

In 1923, the New Zealand Veterinary Association was formed, and in 1926 the Veterinary Surgeons Act established the Veterinary Surgeons Board that formed the legal recognition of

the veterinary profession [9]. In 1936, there were approximately 50 veterinary surgeons, of whom 30 were working in the Department of Agriculture, and the remaining 20 were in private practice or with the Agricultural Colleges. In 1940, there were 75 veterinarians, and by 1954 the number had increased to 250 [10]. Further, as per Caldwell and Wallace's historical accounts, in 1962, the number of veterinarians continued to expand, and there was approximately a total of 365 veterinarians, with 300 in private practice, 53 in Government service, 9 of whom were engaged in full-time research, and 4 in teaching [3,4]. As there was still no veterinary school in New Zealand at the time, approximately a third of the profession was educated in British schools and were mainly recruited for clinical practice [11,12].

By the end of the 19<sup>th</sup> century, local government in New Zealand recognised the demand for competent veterinary services even though the number of various domesticated animals grew a long time prior to this, due to continuing population increases [6]. As a result, in 1963, the Faculty of Veterinary Sciences was established at the University College of Manawatu, providing veterinary tertiary education for the first group of students who graduated five years later receiving a degree in veterinary sciences [4]. Putting aside the animal-based food industry for human consumption, Dixon and Nicholls highlighted that equine healthcare was always an important concern due to humans' dependency on horses for survival and leisure [13]. It has been recognised archaeologically that most domesticated horses were bitted; in other words, horse riding was controlled through a bridle mouthpiece, which had been noticed to have a significant impact on equine teeth [14,15]. As such, equine dentistry took its rightful place by providing an array of beneficial procedures that would improve equine performance while extending horses' health and life span. The steady development of equine dental practice has been taking place over almost 3000 years [16].

The progress of equine dentistry was relatively slow until the 19<sup>th</sup> and the early 20<sup>th</sup> centuries, when it quickly picked up momentum on the international stage, mirroring human medicine and dentistry [16]. As a preventative but also curative practice, equine dentistry mainly focused on the physical removal of the continuously growing sharp and protruding enamel points and edges, occurring in both deciduous and permanent equine dentitions [17]. Starrett et al. [18] emphasized that equine dental treatments were effectively based on the fact that equine teeth belong to the hypsodont type of teeth [18,19]. Hypsodont teeth are structurally and functionally high-crowned teeth with enamel reaching way below the gumline and continually erupting (crown growing) for most of the animal's life. According to Baker and Easley [20], during the mastication process, which can last up to 16 hours a day, dental morphology can alter and result in uneven wear of the grinding surfaces. By creating an uneven occlusion, it can negatively impact occlusal equilibrium and establish a vicious-cycle process of unstable occlusion. Due to these detrimental factors, horses in the wild only lived up to approximately 15 years of age. Common equine dental pathologies have persistently impacted horses with

painful intraoral lacerations and ulcerations of various intraoral soft tissues, such as the tongue, cheeks, soft and hard palate and floor of the mouth [21].

The approach to horses' wellbeing gradually changed due to technological advances in pasture management, improved stabling, better quality feed, various medical and grooming treatments and practices, such as deworming, vaccinations, physiotherapy, farrier work, dental care, et cetera. As equine management evolved and enhanced over time, horses' longevity increased to 30 years of age and even longer [22]. Also, in the past few centuries, equestrianism observed a paradigm shift, meaning that the horse's role shifted from more of a necessity for human survival to social recreation [23]. In the preceding few decades, equine dentistry has flourished as an objective scientific research field providing high quality equine dental advances [24]. To mention a few advancements, these range from preventative measures, saddle and bridle and bit fitting, to therapeutic and surgical treatments [24,25]. As Easley [20] has pointed out, the acceleration of equine dental treatments paralleled human medicine and dentistry, as there are many similarities in extraoral and intraoral anatomy, morphology, histology, embryology and consequently pathologies that accompany the soft and hard dental and supporting dental tissues in humans and horses [16]. It is also recognised that there are multifactorial influences (genetics, environment, diet, et cetera) for a range of clinical and pathological phenomena that are unequivocally similar; however, specific veterinary research in equine dentistry is nevertheless in its early stages [16,26].

Moreover, equine teeth have been used to determine horses' age when a horse has not been branded with a specific birth year, as this evaluation has many different applications in equestrian life. In order to establish the horse's correct age, there are particular features located in equine teeth which come and go at specific time intervals. Even though the horse ageing process is based on subjective experience and observational skills, this assessment turned out to be quite sufficient [26]. Starrett et al. [18] introduced a technological innovation where they developed computerised software that facilitated the equine ageing assessment process by providing more accurate and instantaneous information [27]. Being able to discern a horse's age accurately allows deciding what type of work the horse would be able to perform and anticipate potential corresponding intraoral problems [26].

With newborn foals, even though being born with some deciduous teeth, they still can present teething issues until they are almost five years of age when their permanent successors replace all their deciduous teeth [20]. For most of the horse's maturation (between five and fifteen years of age), their intraoral status should be stable unless disrupted with trauma caused mainly by an infection or physical injury [17]. Horses are considered to be geriatric after fifteen years of age when periodontal (gum) disease starts appearing and taking its generalised course. Thus, some elderly horses, for the most part, experience resorption of supporting dental tissues (recession of gingiva, periodontal ligament, cementum and alveolar bone), accompanied by

periodontal pocketing, trapped foodstuff and subsequent teeth loss [27]. As the science in equine dentistry progresses, some leading veterinary tertiary institutions worldwide, most notably in the UK and USA, have created postgraduate research and clinical training programmes in equine dentistry that deliver high practice standards for veterinarians [28,29].

Different groups of people without formal tertiary training in veterinary or equine dentistry appeared in numerous countries. Consequently, their theoretical and practical knowledge and expertise differed quite extensively depending on their backgrounds. The supply of equine dental providers followed the demand for the increased numbers of horses in New Zealand. According to Economic Impact Report on the New Zealand Sport Horse Industry, there were approximately 120,000 horses present throughout the country [30]. There were, however, 2,475 registered veterinarians working in New Zealand in 2018 [31]. This is approximately one veterinarian to fifty horses, but not all registered veterinarians provide large animals with veterinary care. Hence, those practising with large animals have to divide their professional focus on other types of animals like cattle, swine, goats, sheep, poultry, et cetera

[32]. Furthermore, given the fact that the veterinary profession has been constantly on the Immigration New Zealand's long-term skill shortage list and that there were only approximately 50 veterinarians with postgraduate training or experience in equine dentistry present in New Zealand, this affirms a limitation in the workforce to supply the demand in equine dental services [33].

Over the years in New Zealand, veterinary (equine) practitioners and non-veterinarian equine dental technicians developed different perspectives on the equine dental scope of practice (Figure 1). After many years of meetings between the various stakeholders involved, together with numerous New Zealand institutions, such as the Ministry for Primary Industries, [34] New Zealand Veterinary Association, [35] Veterinary Council of New Zealand, [36] Massey University's School of Veterinary Sciences, [37] and the Allied Veterinary Professional Regulatory Council of New Zealand, [38] it resulted in the Animal Welfare (Care and Procedures) Amendment Regulations 2020 regulating the cutting of animal teeth and extraction of equids' teeth while permitting competent non-veterinarians, for example, equine dental technicians to extract deciduous equid teeth under certain conditions [34-41].



**Figure 1:** Equine dental technician practising floating as part of general equine dental maintenance.

The Allied Veterinary Professional Regulatory Council of New Zealand (AVPRCNZ) was established in 2014, and in 2020 it described professional allied animal healthcare practitioners such as equine dental technicians and defined their scope of practice. It also states the suitable qualifications for equine dental technicians from 2023 [42]. The AVPRCNZ works alongside and with the support of the Veterinary Council of New Zealand with the belief that the "legal recognition and regulation of allied professionals will enable the full adoption of multi-disciplinary veterinary teams,

which will lead to better outcomes for animals, the public and veterinary professionals" [38].

## References

1. Harvey CE (2021) History of veterinary dentistry, including development of oral and dental treatment of wild and zoo, safari park and refuge animals. *Zoo and Wild Animal Dentistry* 9: 1-5.
2. Reid HA (1926) The veterinary profession in New Zealand. *The Veterinary Journal* 82(8): 392-398.

3. Walter R, Buckley H, Jacomb C, Matisoo Smith E (2017) Mass migration and the Polynesian settlement of New Zealand. *Journal of World Prehistory* 30(4): 351-376.
4. (2008) Te Ara-The encyclopedia of New Zealand. In: McKinnon J (Ed.), Naming the country and the main islands, p. 1.
5. (2007) Te Ara the Encyclopedia of New Zealand. In: Mackay D, Cook James (Eds.), Dictionary of New Zealand Biography.
6. Laing AD (1964) Some historical notes on the veterinary profession in New Zealand: Part 1. *New Zealand Veterinary Journal* 12(4): 67-71.
7. Orange C (2015) An illustrated history of the Treaty of Waitangi. Bridget Williams Books, New Zealand.
8. Ministry for Primary Industries
9. Laing AD (1954) The history and development of the veterinary profession in New Zealand. *New Zealand Veterinary Journal* 2(3): 61-68.
10. Caldwell DW (1962) The future of the veterinary profession in New Zealand. *New Zealand Veterinary Journal* 10(4): 67-70.
11. Wallace T (1961) The veterinary profession in New Zealand. *New Zealand Veterinary Journal* 9(2): 21-28.
12. Massey University. Massey University 50 Years of Veterinary Education: A History 1963-2013.
13. Dixon PM, Nicholls V (2016) Science in brief: Keeping up progress with equine dental research. *Equine Vet J* 48(5): 537-539.
14. MacFadden BJ (1994) Fossil horses: Systematics, paleobiology, and evolution of the family Equidae. Cambridge University Press, USA.
15. Esterson E (2014) The Ultimate Book of Horse Bits: What They Are, What They Do, and How They Work. Simon and Schuster, USA.
16. Easley J (2020) A brief history of equine dental practice. *Veterinary Clinics: Equine Practice* 36(3): 425-432.
17. Klugh DO (2010) Principles of equine dentistry. CRC Press, USA.
18. Starrett A, Bedore SJK (2021) 91 Accuracy of a computerized horse aging program. *Journal of Equine Veterinary Science* 100: 103554.
19. Koenigswald WV (2011) Diversity of hypsodont teeth in mammalian dentitions-construction and classification. *Palaeontographica Abteilung A* 294(1-3): 63-94.
20. Baker G, Easley J (2005) Bits, bridles and accessories. *Equine dentistry* (2<sup>nd</sup> edn), pp. 9-22.
21. Demeshkant V, Cwynar P, Slivinska K (2021) Horse tooth enamel ultrastructure: A review of evolutionary, morphological, and dentistry approaches. *Folia Biologica (Kraków)* 69(2): 67-79.
22. Jeffrey D (2009) Oral health in Equidae: Fundamental equine gnathology: Fostering a positive and coherent relationship with the Horse.
23. Wu Z, Zhou C (2021) Equestrian sports posture information detection and information service resource aggregation system based on mobile edge computing. *Mobile Information Systems* p. 9.
24. Townsend KS (2021) The relationship between tooth extraction and changes in blood microbiome in horses (Doctoral dissertation, University of Missouri, Columbia, USA).
25. Lundström T, Birkhed D (2021) Equine peripheral cemental defects and dental caries: Four case reports. *Equine Veterinary Education* 33(6): 286.
26. Staszuk C, Bienert A, Kreutzer R, Wohlsein P, Simhofer H (2008) Equine odontoclastic tooth resorption and hypercementosis. *The Veterinary Journal* 178(3): 372-379.
27. Starrett A, Urso PM, Smith R, Bedore SJK (2021) 82 Effect of dental floating on ADF and NDF digestion after 8 weeks. *Journal of Equine Veterinary Science* 100:103545.
28. British Equine Veterinary Association
29. American Association of Equine Practitioners.
30. Matheson A, Akoorie ME (2012) Economic impact report on the New Zealand sport horse industry. The University of Waikato.
31. Careers.govt.nz. Veterinarian. What are the chances of getting a job?.
32. New Zealand Veterinary Association. Veterinarians with expertise in equine dentistry.
33. New Zealand Veterinary Association. Veterinary shortage in New Zealand.
34. Ministry for Primary Industries.
35. New Zealand Veterinary Association.
36. Veterinary Council of New Zealand.
37. Massey University's School of Veterinary Sciences.
38. Allied Veterinary Professional Regulatory Council of New Zealand.
39. Ministry for Primary Industries.
40. Parliamentary Counsel Office, New Zealand Legislation, Animal Welfare (Care and Procedures) Amendment Regulations 2020
41. Ministry for Primary Industries, Guide to the Animal Welfare (Care and Procedures) Regulations.
42. Allied Veterinary Professional Regulatory Council of New Zealand, Scope of Practice, Equine Dental Technician.

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