Declaration

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This thesis entitled “The behaviours and attitudes surrounding the use of equine complementary and alternative medicine amongst horse-carers in the Auckland region” is submitted in partial fulfilment for the requirements for the Unitec degree of Master of Osteopathy.

Candidate’s declaration
I confirm that:

• This thesis represents my own work.
• Research for this work has been conducted in accordance with the Unitec Research Ethics Committee Policy and Procedures, and has fulfilled any requirements set for this project by the Unitec Research Ethics Committee. Research Ethics Committee Approval Number: 2010-1123

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The behaviours and attitudes surrounding the use of equine complementary and alternative medicine amongst horse-carers in the Auckland region

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Introduction to the thesis

In recent years, research into complementary and alternative medicine (CAM) has expanded, perhaps in response to a simultaneous rise in public interest and use. CAM encompasses a large group of diverse medical and health care systems, practices and products that are not generally considered part of conventional medicine (Duke, 2005). Osteopathy is a small part of CAM, and the scope of practice permitted by the Osteopathic Council of New Zealand states that registered osteopaths are primary healthcare practitioners, who facilitate healing through osteopathic assessment, clinical differential diagnosis and treatment of dysfunctions of the whole person (OCNZ, 2011). Osteopaths use various recognised techniques to work with the body’s ability to heal itself, thereby promoting health and wellbeing.

Like human CAM, there has been a growing interest in the use of CAM options as an integral part of veterinary rehabilitation and maintenance (Jeffcott, 1980). Despite reports of increased use of animal CAM by the public (Laulis & Thomason, 2002), there is a current lack of information about the use and attitudes of horse-carers towards animal CAM. Further research about CAM therapies which horse-carers are using and finding beneficial may allow provision of more effective horse health care. This thesis explores the behaviours and attitudes surrounding the use of equine CAM amongst horse-carers.

The thesis is divided into three main sections: Section 1 is a literature review, with an emphasis on the definition and development of human and animal CAM, CAM and horse health research, and attitudes towards CAM and animal osteopathy. Section 2 is a manuscript outlining the study conducted as part of this thesis, laid out in the format specified for submission to the New Zealand Veterinary Journal. Section 3 includes, as appendices, confirmation of ethics approval, participant information sheet and consent form followed by the online questionnaire, additional showjumping survey and the guidelines for authors submitting to the New Zealand Veterinary Journal.
Section 1: Literature review
Introduction

Interest in complementary and alternative medicine (CAM) has grown in human medicine. The prevalence of use and a broader acceptance of CAM has increased in Germany, the United States of America (USA), the United Kingdom (UK), Australia and New Zealand (NZ) (Barnes, Powell-Griner, McFann, & Nahin, 2004; Cohen, Penman, Pirotta, & Costa, 2005; Emslie, Campbell, & Walker, 2002; Poynton, Dowell, Dew, & Egan, 2006; Stange, Amhof, & Moebus, 2008; Tindle, Davis, Phillips, & Eisenberg, 2005). It is unclear whether these trends in interest in human CAM are followed in animal (veterinary) CAM attitudes because there is a dearth of literature.

The purpose of this review is to report on the current literature of animal and human CAM research and practice by firstly defining and discussing the concept of CAM, secondly reviewing the prevalence of use of complementary and alternative veterinary medicine (CAVM), and thirdly exploring the attitudes of horse-carers and veterinarians towards CAVM. This review has a focus on horse (equine) health and animal osteopathy.

Human CAM definition

Defining CAM is difficult, because the field is very broad and constantly changing. The National USA Centre for Complementary and Alternative Medicine defines CAM as a group of diverse medical and health care systems, practices, and products that are not generally considered part of conventional medicine (also called Western, orthodox or allopathic medicine) (“CAM Basics,” 2010). However, the philosophies and theories behind CAM are hardly mentioned. Complementary, allied or integrative medicine refers to use of a non-conventional therapy together with, or working alongside, conventional medicine. An example for this is the use of acupuncture in addition to allopathic medicine to help lessen pain. Alternative medicine refers to use of medicine in place of conventional medicine. A study reported that
CAM use in Americans treating themselves is mainly complementary, rather than alternative (Kurtz, Nolan, & Rittinger, 2003). The NZ Ministerial Advisory Committee on Complementary and Alternative Health similarly defines CAM as differing from the dominant Western medicine but emphasises the philosophies and theories more than the US definition, as it states that CAM is:

a broad domain of healing resources that encompasses all health systems, modalities, and practices and their accompanying theories and beliefs, other than those intrinsic to the politically dominant health system, of a particular society or culture in a given historical period. CAM includes all such practices and ideas self-defined by their users as preventing or treating illness or promoting health and well-being. (Koopman-Boyden et al., 2002, p. 3).

**Animal CAM definition**

Definitions for animal CAM are similar to those of human CAM. In both the USA and NZ animal CAM is described as methods of treatment that are not included in the traditional veterinary therapy as practised in the curricula of veterinary study. Complementary and alternative veterinary medicine (CAVM) is defined by the American Veterinary Medical Association more specifically as

a heterogeneous group of preventative, diagnostic, and therapeutic philosophies and practices that include but are not limited to: aromatherapy; Bach-flower remedy therapy; energy therapy; low energy photon therapy; magnetic field therapy; orthomolecular therapy; homeopathy; manual or manipulative therapy (osteopathy, chiropractic, or physical medicine and therapy); nutritional therapy; and phytotherapy. ("AVMA guidelines for complementary and alternative veterinary medicine.," 2001, p. 2).
**Animal CAM development**

The very first school that taught scientific veterinarian care was established in France in 1762, followed by others in Europe (Melville, 2011). Prior to this, people providing care for horses learnt their trade through apprenticeships and were called *farriers*. In 1674, farriers were regulated in England as the people responsible for the treatment of horses. However, in 1844, the Royal College of Veterinary Surgeons advocated that horses should only be treated by veterinarians (Melville, 2011; Pusey, Brooks, & Jenks, 2010). Before the mid 1800s, very few equine-related professions had formal qualifications (Dunlop, 1996). Over the following decades, farriers reverted to specialising in the craft of shoeing horses, and those trained at the new veterinary colleges undertook the treatment of animals. Some would say that horses have such a high value to society, and historically an even greater value due to their use in agricultural food production, transportation and thus their importance for livelihood, that there has always been a need to keep these animals healthy. Therefore, various cultures developed therapies that attempted to keep their animals healthy using pre-controlled medicine and pharmaceuticals. Many of these therapies, which have been around for thousands of years and would have been the only form of treatment available before the advent of veterinary medicine.

There is a large range of animal CAM therapies, from the relatively well-known chiropractic, physiotherapy and massage to the less common, such as electrical muscle stimulation and photon therapy. Of these therapies, advocates mainly claim to use them on dogs and horses. Periodicals devoted to different aspects of horsemanship regularly run features extolling the virtues of various approaches, and a myriad of horse websites offer a variety of CAM, with generally unverified claims.

When referred to in veterinary research literature, equine manual therapies usually include physiotherapy, massage, chiropractic, osteopathy and Bowen therapy. Manual therapy is said to help maintain a level of functionality and
comfort for the horse throughout recovery from injury or surgery. Other claimed benefits of manual therapy are to help maintain functionality and comfort for the horse in training or competition by trying to reduce or control pain or swelling, to increase joint range or to improve muscle function in symptomatic horses (Haussler, 2009; King, 2010; Loken, 2001).

The underlying philosophy across the diverse fields of CAM is to view patients in relation to their entire state of health (mental and physical). This philosophical approach is often termed holistic ("CAM Basics," 2010). In relation to equine health, a holistic approach includes the horse’s diet, the quality of their environment, and the influence of the people who ride and train them. Equine CAM practitioners have traditionally placed a greater significance on these holistic concepts than conventional equine medicine therapists, because of their philosophy. However, conventional equine medicine therapists are beginning to realise the value of this alternative philosophy. A review article published by Fleming (2002) acknowledges that conventional practitioners are now realising that there are correlations between shoeing, track surfaces, dental malocclusion, poor saddle fit and lameness, which previously may have been treated without such consideration.

Many CAM therapies are targeted at optimising physical and/or mental performance. This is particularly relevant for horses, because of their societal role in competitive events. The human athlete at international level is now often supported by a team of health professionals, including both allopathic and CAM practitioners. This helps maintain and enhance the athlete’s health and performing potential. In recent years, similar to the human athlete, equine athletes have had official use of physiotherapists during Olympic and international level equestrian competitions for treatment on many horses, including teams from England, Australia and NZ (McGowan, Stubbs, & Jull, 2007; Pusey et al., 2010). It is also reported that not only are physiotherapists treating the rider, but they also engage in the assessment and treatment of their horse(s) (Buchner & Schildboeck, 2006; Edge-Hughes, 2009). There is some speculation that the rider’s imbalance in the body may transmit to the
horse during riding, causing altered biomechanics in the horse and vice versa (Pusey et al., 2010). However, this conjecture is currently theoretical and lacks supporting evidence. Since CAM is being used by elite equestrian teams, this may indicate that the concept of the CAM practitioners’ role in maintaining and developing the potential of the equine athlete is gaining recognition.

**Horse health research**

In the last 30 years, there has been a great deal of research into scientifically-oriented equine veterinary medicine, especially in relation to breeding, training, pathology, injury rehabilitation and nutrition, particularly applied to the racing industry. Increased support for this research is evidenced by substantial research centres and foundations set up to support funding in this area. Despite this support, there is a current lack of quality studies of equine CAM (Buchner & Schildboeck, 2006; Haussler, 2009). This lack of research seems unusual considering the large commercial and recreational role horses play. Horses are domesticated and in New Zealand are kept and ridden by people for some purpose, from working on a farm to a wide range of sport and recreational pursuits such as pony club, showjumping and racing. Therefore, horses are likely to be viewed as an investment that the owner wants to keep in good working order. In addition to pony club and professional harness and gallop racing, equine sports include show jumping, show hunting, eventing, dressage, polo, hunting, trekking, and endurance racing and driving. Even though they perform quite different functions, both working-horses and sport-horses require strength, stamina and a high level of fitness. Therefore, horses can potentially suffer from similar problems to the human athlete (Monti, 2000).

There appears to be limited data on the role and consultation of CAM therapists by horse-carers in the competitive equestrian industry. However, there are a number of studies that have investigated only the anatomy and pathology of the equine spine and pelvis, predominantly focusing on problem
areas such as the thoracolumbar and lumbosacral joints. These areas are prone to common soft tissue injuries, for example conformation defects such as scoliosis, vertebral lesions, such as chronic sacroiliac strain, along with other conditions (Dyson, 2009; Jeffcott, 1980, 1999, 2004; Jeffcott, Bathe, & Henson, 2002). Irrespective of the country of study or the equestrian sport, a range of studies on horses participating in various sporting events have shown that the major reason for loss of horses from training and competition is from musculoskeletal injury and lameness (Cogger, Evans, Hodgson, & Reid, 2008; Dyson, 2009; Murray, Walters, Snart, Dyson, & Parkin, 2010).

Another study similarly found that the most commonly diagnosed problem, confirmed using radiological evidence in competitive jumping horses (173 horses out of a total sample of 443), was overriding of the spinous processes in the thoracic and lumbar regions. This caused a loss of suppleness and spinal flexibility, and resulted in lower performance and bouts of back pain (Jeffcott, 1980).

Studies surrounding the health of horses have tended to focus solely on the nature of injuries/problems common in horses. These preliminary studies may facilitate practitioners’ understanding of the mechanisms of injuries. Although this may aid treatment and even highlight areas of concerns regarding horse health, there are very few studies on the objective effects that CAM treatments have on these problems.

**CAM research**

Data on the effectiveness of human CAM are mixed. Musculoskeletal problems seem to be the most prevalent problems presented to human or animal CAM practitioners, especially ‘back problems’. Review of therapies for spinal problems identified a randomised control trial, controlled against a sham treatment, aiming at assessing the short-term effectiveness of manipulation in the management of chronic low back pain (over 6 months of back pain) in 85 patients (ages between 18-55 years). This study suggests
that vertebral manipulation is a useful and effective short-term treatment for chronic low back pain. It was reported that, after the four weeks of treatment, the visual analogue scale (VAS) pain score of the true manipulation group reduced significantly from initial assessment with the mean changing from 69% to 37%, as did the mean of the Oswestry disability score (from 15% to 12%); with no similar improvements seen in the sham manipulation group. In addition, the objective clinical examination features of dysfunction were significantly improved in the active treatment group, as shown by a disappearance of the area of tenderness, the area of contraction in the paravertebral muscles, or of the pain on palpating the spinous processes, in approximately 50% of participants (Elleuch & Ghroubi, 2009). However, there are some uncertainties about the evaluation of this study, as it was not clear that the changes in the treatment group were greater than the changes experienced in the sham group, and perhaps it was not significant and the analysis was adjusted to compare changes in the two groups separately. The analysis of the study was also based on subjective methods, such as the spinal pain data obtained by VAS and function (assessed via the disability Oswestry score), as well as more objective measures such as palpation. The main uncertainty is that the validity and reproducibility of palpatory findings on segmental examination of the spine are so far unknown, as many mistakes can be made by the examiner by using too much, or too little, pressure.

Acupuncture is widely known for treating musculoskeletal pain, with the English National Institute for Health and Clinical Excellence (NICE) currently recommending acupuncture treatment for patients with persistent low back pain (Cheshire, Polley, Peters, & Ridge, 2011). In addition to treating musculoskeletal pains, it has been suggested that acupuncture was traditionally used to treat respiratory, digestive, gynaecological and many chronic conditions (Fleming, 2002). However, convincing evidence to support the effectiveness of acupuncture for problems other than musculoskeletal is limited. In other CAM research, a systematic Cochrane review of acupuncture for treatment of tension-type headaches included a meta-analysis of 11 trials with 2317 participants in total (Linde et al., 2009). All selected trials investigated whether acupuncture was effective in the prophylaxis of tension-
type headache and an overall effect of acupuncture was noted. Two large trials investigating whether adding acupuncture to basic care (which usually involves only treating unbearable pain with pain killers) found that those patients who received acupuncture in addition to standard therapy had fewer headaches (Linde et al., 2009). Overall, these trials found slightly better effects in the patients receiving the true acupuncture intervention (Linde et al., 2009). Forty-seven percent of patients receiving acupuncture reported a decrease in the number of headache days by at least 50%, compared with 16% of patients in the control group (sham acupuncture). Evidence in support of acupuncture for tension-type headaches had previously been considered insufficient, but the authors of the review, based on the results of some recent large trials, now conclude that acupuncture could be a valuable non-pharmacological tool in patients with frequent episodic or chronic tension-type headaches.

It has been suggested that developments in veterinary acupuncture have been going on for as long as acupuncture has been used in treatment for humans, as the origins and course of development closely parallel that of human acupuncture (S. Scott, 2001). Evidence of the efficacy of acupuncture in treating any animals is limited. However, it was found in two reviews from the UK and USA about veterinary practices that animal acupuncture is generally accepted for use on animals (Fleming, 2002; S. Scott, 2001). As for human acupuncture, acupuncture points and meridian charts are available for animals. In a review article of non-traditional approaches to pain management, Fleming has cited one doctoral thesis demonstrating the efficacy of acupuncture in the treatment of equine colic pain. The author demonstrated an increase in stomach and caecal motility, and increased endorphin and epinephrine levels after treatment with electro-acupuncture (Fleming, 2002). However, a number of important methodological details are unclear from this review, for example whether or not this was a controlled study, how the condition was diagnosed and the study’s sample size.
CAM and pain management

Equine spinal pain is thought to be a highly prevalent form of musculoskeletal problems, particularly in the thoraco-lumbar region, and often presents in the form of poor performance rather than obvious acute back pain or lameness (Haussler, 2009, 2010; Jeffcott, 1980). A recent review article about the role of manual therapies in equine pain management indicates that spinal manipulation has been shown in several studies to be effective in reducing pain, improving flexibility, reducing muscle tone and improving symmetry of spinal kinematics in horses (Haussler, 2010). A manual therapy study assessed the effects of an 11-week physiotherapy intervention on the mobility of the thoracic spine in 14 horses (Craig, Stubbs, & McGowan, 2006). This study found that the owners had noticed positive changes in their riding following the treatment. Also, five out of the seven horses in the treatment group made improvements between 50% and 100% pre- to post-treatment on ultrasound evaluation of the specific thoracic spinal segments. This study’s outcomes for all horses were for the range of motion (flexibility) for specific stretches and perceived amount of glide with inter-segmental joint mobilisations. There were gradable changes in all outcomes for all horses. With a significant increases in distance between vertebral spinous processes using real time ultrasonography at all levels were found in the treated horses compared to controls, which increases the ability for a greater range of motion at that joint (Craig et al., 2006).

Anecdotal evidence suggests that manual therapy, in particular equine massage, is gaining in popularity and is being used more frequently than in the past for management of equine athletes and recreational horses (Apfel, 2008; M. Scott & Swenson, 2009). However, supporting data is hard to find. Massage is used with the objective of achieving muscle benefits, such as relief of muscle tension and stiffness, reduced pain and spasm, improved joint flexibility and range of motion, and potentially enhanced athletic performance (M. Scott & Swenson, 2009).
Future studies of equine CAM employing sufficient scientific rigor will be necessary to provide veterinarians, trainers and owners with definitive data and scientifically-based confidence in the use of equine CAM. However, it could be argued that preliminary research including anecdotal positive effects and case studies indicating potential benefit, should not be disregarded. Since there is a lack of definitive data due to the common methodological weaknesses of studies in equine CAM, these unverified claims of benefit could be employed for the basis of future research.

**Equine CAM research**

A comprehensive search of the available literature regarding CAM research revealed four studies, two which were animal studies which did not discriminate between animal types and it was unclear whether either included horses. Animal CAM research needs to increase its scientific rigor of studies, especially on the effectiveness of treatments, to prove its worth amongst conventional veterinary studies. The other two studies, were Meredith *et al.* (2011) and Coleman *et al.* (2006), both of which are NZ studies investigating the use of CAVM by interviewing horse-carers. These studies show that between 62% (Meredith *et al.*, 2011) to 82% (Coleman *et al.*, 2006) of horse-carers have used at least one type of CAM for the treatment of their horses.

Considering all available data about equine CAM use and when comparing the Meredith *et al.* (2011) and Coleman *et al.* (2006) study, the most likely reason for the greater prevalence of use identified in the Coleman *et al.* (2006) compared to the Meredith *et al.* study would seem to be related to the horse disciplines surveyed or the definition of CAM used. For both studies, there was a limited inclusion of horse types. The difference in horse disciplines is that in the Meredith *et al.* (2011) study asked about the use of allied health therapies also in owners of horses used for show-jumping, dressage and racing whilst, the Coleman *et al.* (2006) study investigated use of alternative therapy in only one horse type (race-horse). The difference in definition was that *allied (complementary) therapy* in the Meredith *et al.* (2011) study includes physiotherapy, chiropractic and equine sport massage,
whereas alternative therapy in the Coleman et al. (2006) study, does not. Coleman et al. (2006) found that there was substantial use of CAM within the racing industry, as 82% of the 23 horse trainers had used at least one type of therapy in the previous 12-month racing season, and 36% of horses treated with alternative therapy were exposed to the treatment at least every two weeks. Meredith et al. (2011) also found that allied therapy use was widespread, with 62% of respondents having used allied therapy to treat their horses in the past year. The increased prevalence of use found in the Meredith et al study might reflect that owners of horses in show-jumping and dressage actually use CAM more frequently than race-horse owners do. No studies have surveyed use across the entire competitive equestrian industry that consists of other sport-horse events, such as pony club, and other forms of racing, such as harness racing. Because of the limited range of therapies and horse competitive events included in these studies, it is unclear if the data can be generalised across all New Zealand equestrian practices.

Two other American animal owner surveys exist, which have been included in past reviews (Laulis & Thomason, 2002; Monti, 2000), but were unavailable as original reports for this review. It is not clear from report of these studies whether horses were considered as ‘pets’. One of these American surveys reported that 42% of animal owners used CAM therapies on their animals in 1997, which represented an 8% increase from 1990 when the same survey had previously been conducted (Monti, 2000). According to the other pet owner survey conducted in 2000 by the American Animal Hospital Association, 17% of the 1,189 respondents said they had used a type of alternative medicine on their pets, with massage the most frequently used therapy (Laulis & Thomason, 2002).

**Attitudes towards CAM**

Despite the modest occurrence of high quality research on CAM modalities, in relation to human care, some CAM modalities have attracted increased
attention from the government and insurers such as New Zealand’s Accident Compensation Corporation (ACC). In NZ many CAM practitioners such as physiotherapists, chiropractors, osteopaths and acupuncturists are now ACC providers and allow treatment cost subsidies to people who have injured themselves ("ACC subsidies," 2011). As well as the increased attention from organisations, there has been a change in attitude from the public. Explanations for the increase of CAM use have been proposed, including availability of information on the Internet, the desire of patients to be actively involved with medical decision making and dissatisfaction with conventional (Western) medicine (Barnes et al., 2004). The majority of US medical schools now offer courses in alternative medicine (Elsenberg et al., 1998) and therefore, another possible explanation for CAM growth is that physicians/general parishioners are more aware of its existence, or are practising CAM themselves. The prevalence of use and broader acceptance of CAM in physician and the general public has increased in Germany, the USA, the UK, Australia and NZ (Cohen et al., 2005; Emslie et al., 2002; Poynton et al., 2006; Stange et al., 2008; Tindle et al., 2005). Data from around the beginning of the millennium indicate that within a 12-month period, 62% of US adults (Barnes et al., 2004; Tindle et al., 2005), and 47% of the UK population had used CAM (Thomas & Coleman, 2004). Similarly, a 2005 national survey of Australian adults estimated that one in every two people had used at least one non-medically prescribed alternative therapy, and one in five had attended a consultation with a non-medically trained therapist (Xue, Zhang, Lin, Da Costa, & Story, 2007).

There has also been a high acceptance of CAM therapies by physicians reported in Germany, with 51% physicians referring their patients to some form of CAM therapy (Cohen et al., 2005; Stange et al., 2008). Likewise, approximately half of people who use CAM in the UK and NZ inform their physicians or other health professional that they had consulted a CAM practitioner (Thomas & Coleman, 2004; Wilson, Dowson, & Mangin, 2007).
Expenditure

It has been postulated that in human medicine, expenditure on CAM treatments such as acupuncture, chiropractic, homeopathy, nutritional supplements and herbal medicine are currently almost on par with expenditure on ‘non-alternative’ medicine, including visits to medical practitioners and pharmaceuticals. According to a 2008 governmental survey, the total was estimated in a government survey that the total out-of-pocket (not reimbursed by insurance) expenditure relating to CAM in the USA were estimated to be US$33.9 billion, US$11.9 billion spent on CAM practitioner visits is equivalent to approximately one-quarter of total out-of-pocket spending on traditional physician visits (Tindle et al., 2005). Expenditure on CAVM, by comparison, may also be on a par with allopathic veterinary care. Coleman et al. (2006) estimated that horse owners spent NZ$43,000 on CAVM therapy in two cities of the North Island of NZ, NZ$18,000 more than the NZ$25,026 spent on veterinary treatments in the last 12 months assessed in the study (Coleman et al., 2006).

In comparison to the broader acceptance and possibly increased awareness of human CAM in the general public, the attitudes of horse-carers are also becoming more aware of musculoskeletal problems accepting of CAVM. Musculoskeletal problems seem to be the most prevalent problems presented to human or animal CAM practitioners. A survey about the perceptions of owners on clinical problems of dressage horses in the UK found that perceived back problems associated with lameness was common (24% of horses owned by the 2554 respondents) (Murray et al., 2010). Validity of the diagnoses may be in question in this study, as the majority of diagnoses (80%) did not involve a veterinarian. However, it was noted that the owners of dressage horses either have little confidence in, or see little requirement for, the involvement of the veterinary profession in the diagnosis of back problems. Furthermore, CAM therapies predominated as the most popular treatment for horses reported with a back problem. Therefore, there is some evidence that horse owners commonly seek CAVM treatment. Some support for CAVM over conventional approach may come from a recent study which
showed that chiropractic treatment was 19% more effective than medication with phenylbutazone (a non-steroidal anti-inflammatory drug) in increasing mechanical nociceptive thresholds in horses over the course of a week (Sullivan, Hill, & Haussler, 2008).

CAM therapies are still one of the most controversial and continued sources of uncertainty in veterinary medicine (S. Scott, 2001). Similar to human CAM and some fields of allopathic medicine, there is an inconsistency between the CAM practitioners’ and the conventional practitioners’ views, and although opinions are changing with CAM becoming more accepted and integrated into the orthodox healthcare, there are still some issues of concern. There is a similar lack of consensus between the allopathic veterinary practitioners and CAVM practitioners. In a study on the perceptions of Irish veterinary surgeons about animal physiotherapy and another NZ veterinary survey, the main issues veterinarians raise when evaluating CAM relate to the qualification of the CAM practitioner/therapist and the efficacy of many treatments, such as manual therapy (Doyle & Horgan, 2006; Webb, 2005).

There have been recent publications reflecting increased veterinary research and clinical interest in equine back problems, and the underlying pathology of some of these conditions is becoming better understood. This interest in musculoskeletal problems and concern about practitioner qualifications may be prompting veterinarians to find ways to treat these common problems themselves with alternative therapy. The potential benefit of veterinary involvement in an integrated approach to CAM therapy is also becoming more clearly recognised, with the ability of a veterinary specialist to specifically diagnose or rule out serious pathology before specialist CAM therapy, as emphasised in the Equine Back Pathology Diagnosis and Treatment book (Henson, 2009). Incorporation of the veterinarian and CAM practitioners as part of an integrative approach to treating and rehabilitation of the horse has begun to arise over the past six years. When reviewing the literature about veterinarians’ attitudes towards CAVM, it seems to be comparable to the changes in attitudes in humans towards CAM. Some acupuncture data for example report that interest in CAM from the veterinary profession has been
primarily driven by owner demand (S. Scott, 2001). The same article states that the media has focused public attention on acupuncture as a possible therapeutic intervention for pets, with popular magazines, television programmes and the general press reporting individual case reports, and features on local veterinarians practising acupuncture (S. Scott, 2001). Veterinarians are now seeking courses in acupuncture, and are especially interested in using it to treat musculoskeletal pain (S. Scott, 2001).

A search of the literature on veterinarian perceptions of CAM and corresponding referral practices identified two original reports. One of these is an Irish study (Doyle & Horgan, 2006) and the other a 2005 NZ student thesis (Webb, 2005). The Irish study investigated veterinary surgeons’ perception, knowledge and use of animal physiotherapy in Ireland, while the NZ thesis investigated the referral practices of equine veterinarians to complementary therapies. Both reports noted similar veterinary attitudes to CAM. Results from the Irish study indicated that 79% of respondents were aware of animal physiotherapists and several respondents indicated that they were very interested in referring to an animal physiotherapist. The thesis reported that 75% of the 61 veterinarians who responded to the mailed survey had already referred a horse for CAM therapy (Webb, 2005). The surveyed Irish veterinarians agreed that they recognised that the animal physiotherapist can have a role in modern veterinary medicine (Doyle & Horgan, 2006). It was thought by the NZ and Irish veterinarians that, if equine physiotherapy and other CAVM were to develop, there needed to be increased interaction and co-operation between veterinary surgeons and CAVM therapists (Doyle & Horgan, 2006; Webb, 2005). In addition, an article by the Australian Veterinary Journal in 1996, seven veterinarians from different states were asked if alternative therapies had a role in their practice. They all believed that complementary or alternative therapy should be considered as they had had experiences where it had been used successfully in conjunction with their conventional treatment and they believed that there is increased evidence that CAM therapies can be effective, especially on more chronic conditions (Anonymous, 1996).
It is considered by some that CAM will “undoubtedly be integrated into mainstream medicine, but it is up to veterinarians to develop effective and ethical means by which to train and use these techniques” (Fleming, 2002). Organisations are already recognised and making great strides in establishing effective training curricula. The International Veterinary Acupuncture Society offers yearly certification programs in the USA. The American Veterinary Chiropractic Association conducts courses in chiropractic manipulation, and the Academy of Veterinary Homeopathy sanctions the certification of qualified veterinary homeopaths (Fleming, 2002); in 2009 there were more than 900 animal chiropractic professionals to have been certified since the start of the programme (Wargo, 2009). Musculoskeletal problems seem to be the most prevalent problems presented to human or animal CAM practitioners, especially ‘back problems’. In addition, CAM practitioners emphasise that back injuries potentially provide the veterinary profession with a great opportunity to interact positively with other therapists, and to provide animal owners with more accurate diagnoses and improved decision making by selecting the most appropriate therapeutic services (Riggs, 2010).

**Animal osteopathy**

Compared with other human manual therapies such as chiropractic and physiotherapy, human osteopathy has limited and less available research. The same applies to animal osteopathy. In the early 1980’s, in response to increasing interest from the general public and the osteopathic profession itself, the regulating body in England asked for a compilation of osteopaths with a special interest in treating animals. This list formed the core members of the Society of Osteopaths in Animal Practice in 2004.

As a somewhat young concept, the very first programme teaching animal osteopathy opened in 1993 at the European School of Animal Osteopathy. However, research and work took place many years before this. Following the
development of this school, Anthony Pusey, one of the first equine osteopaths who treated a number of horses that were Olympic competitors from many different nations, as well as the horses of the Household Calvary and the Knightsbridge Barracks, started another school (Pusey et al., 2010). Pusey also developed a Master of Science degree in the application of osteopathy in treatment of animals at the University of Wales. A further venture in the manual therapy field for horses was the Stuart McGregor course established in 1999 which taught McGregor body-adjustment techniques (McGregor, 2009). The principles of osteopathy are apparently consistent across species with schools and people practising on horses and dogs using the same background principles as in human osteopathy (Arnold, 1990; McGregor, 1984). The capacity of a horse to be therapeutically manipulated is often overlooked as the horse may be assessed as being too big or too wild to be able to treat with this approach. Hence, there are some who claim it is possible to manipulate the spine of a horse, while others say that you can not (Bromiley, 2007). However, it seems that in the literature that this ability to manipulate the spine of the horse is now accepted, with studies and reviews now investigating the effect of manipulation rather than the ability to manipulate (Alvarez, L'Aim, Moffatt, Back, & Weeren, 2008; Boldt, 2002; Goff, 2009; Sullivan et al., 2008). In Europe, the Veterinary Surgeons Act of 1966 made it illegal for anyone other than a veterinary surgeon to treat an animal. An exception to this were physical therapists, including physiotherapists, chiropractors and osteopaths, who could treat an animal under the direction of a veterinarian, either with direct supervision or by referral (Pusey et al., 2010).

In NZ, no such law exists. The Veterinary Council of NZ publishes a code of professional conduct for veterinarians which states that the use of the products and/or services of alternative or complementary therapies may be considered for discretionary use (Code of professional conduct for veterinarians., 2007). NZ has no CAM legislation for practising on animals. Hence, anyone may practice manual therapy on animals, although they are still not permitted to call themselves ‘osteopaths’ or ‘animal osteopaths’ as the osteopath title is protected by the Health Practitioners Competence Assurance Act (HPCA, 2003). NZ has no schools for teaching animal osteopathy, chiropractic or physiotherapy, although there are some short
courses that anyone can take to learn equine massage (Harford, 2000),
equine touch therapy, or Bowen therapy (Ruddock & Ruddock, 2009).

Animal Osteopathy is not excluded from the scope of practice for osteopaths
and is an avenue of practice that can be taken once qualified. However,
because many osteopaths do not even know this, more scientific research will
help increase awareness for people that have an interest in this line of work.
Haussler (2009) has written a review article on the many different manual
therapy techniques in equine practice but there is a lack of information about
frequency of use by modality, reasons for use and perceived success with
use.

Some osteopaths say that practicing on animals has enhanced their practice
on people, sharpened observational skills of the body both at rest and in
motion, relying on the findings of their hands and refined diagnostic evaluation
(Pusey et al., 2010).

**Summary**

CAM is now common practice. There is some evidence that there has been a
growing interest in CAM and use of CAM options by society in the past
decade, seeking treatment not only for themselves, but also for their animals.
It seems that treating horses with CAM is becoming an integral part of equine
rehabilitation and performance maintenance. There is a current lack of
information about the use and attitudes of horse-carers towards animal CAM
in NZ. There are only two previous studies that investigated the use of CAM in
animals: one study (Coleman et al., 2006) that considered only thoroughbred
racing and not the rest of the equine industry; the other (Meredith et al., 2011)
surveying owners of thoroughbreds, showjumping and dressage horses. It is
unknown if these results can extend to the whole of the equine industry, or if it
applies to the many horses engaged in other activities like pony club, and the
other sport-horse modalities like endurance racing and eventing.
For these reasons, a study was undertaken to investigate the behaviours and attitudes surrounding the use of equine CAM amongst horse-carers within three disciplines of the equestrian industry: Racing, Sport-horse, and Pony Club. Section two of this thesis reports on the investigation.
References


http://www.vetjournal.org.nz/


Thomas, K., & Coleman, P. (2004). Use of complementary or alternative medicine in a general population in Great Britain. Results from the


Section 2: Manuscript

Prepared in accordance with the *New Zealand Veterinary Journal* guidelines (Appendix: D.).

In order to maintain readability and consistency of format throughout the thesis tables have been included in the text, page numbering in the left margin has been excluded, and the text has been continued using 1.5 rather than double spacing.
Abstract

**AIM:** To explore the behaviours and attitudes of horse-carers surrounding the use of equine complementary and alternative medicine (CAM).

**METHODS:** Owners or trainers mainly responsible for the care of one or more horses, who were based in the Auckland region, completed an online survey of CAM use, distributed via contact people from each of three equine disciplines: Sport-horse, Racing and Pony Club. To further investigate prevalence of CAM use, an additional short questionnaire was administered to competitors prior to a single showjumping competition.

**RESULTS:** With only a 10% response rate, ninety-two percent of the main survey respondents had used CAM to treat their horse in the preceding 12 months; Sport Horse (95%), Pony Club (80%) and Racing (88%). Of the 17 different CAM therapies identified, physiotherapy, nutritional therapy and massage were the most commonly reported, being used by 23%, 18% and 14% of respondents respectively. Therapies, especially manual, were mainly used for musculoskeletal problems. All respondents who had used CAM therapy perceived it to be at least somewhat beneficial for their horse. The additional show-jumping questionnaire had a very high response rate (88% of competitors) and confirmed that prevalence of CAM use amongst horse owners and trainers representing one important subset of all Auckland horse owners and trainers was likely to be very high.

**CONCLUSIONS AND CLINICAL RELEVANCE:** These data suggest widespread use of a variety of equine CAM therapies among horse-carers in the Auckland region to treat a range of equine problems, and that the majority of people who used CAM found it beneficial. Dissemination of this information may raise awareness about available treatments and their perceived outcome, thus providing both horse-carers and equine health practitioners with information that could benefit the welfare of their horses.

**KEY WORDS:** Sport-horse, race-horses, pony club, prevalence, attitudes, showjumping, horse-carers, online survey, showjumping survey.
Introduction

Complementary and alternative medicine (CAM) has previously been defined as a term used to describe an array of very different conceptual disciplines, approaches and techniques that are not presently considered to be part of conventional human or veterinary medicine (Barnes et al. 2004; Loken 2001). However, recent views suggest that therapies such as physiotherapy, chiropractic, acupuncture and massage may also be considered mainstream in some parts of the world (Cohen et al. 2005).

The prevalence of use and a broader acceptance of CAM in humans has increased in Germany, the USA, the UK, Australia and New Zealand (NZ), in recent years. In particular, an increasing trend was noticed from the early 90s to 2005 (Cohen et al. 2005; Emslie et al. 2002; Fox et al. 2010; Poynton et al. 2006; Stange et al. 2008; Tindle et al. 2005; Xue et al. 2007). There is much less available research to the researcher on CAM use in animals. According to a 1997 American survey, 42% of animal owners used CAM therapies on their animals in comparison to a 1990 survey that indicated 34% of animal owners as referenced in Monti (2000). It is unclear whether the recent trend for increased use of CAM in humans extends to animal treatments and, therefore, whether prevalence of use in animals is now greater than in the 1990s. The degree of CAM use on horses is unknown. Some manual therapy books suggest substantial use of equine CAM, especially in the racing industry (Bromiley 2007; Domhold 2000; Pusey et al. 2010). Two NZ studies confirm this suggestion. One 2006 study on race-horse trainers reported that 33% of horses had at least one exposure to ‘alternative therapy’ in the last full year’s racing season and estimated that owners spent NZ$18,000 more on CAM therapy nationwide than on veterinary treatments (Coleman et al. 2006). The other, a 2011 study, found that the use of allied health therapies for the treatment of competition and race-horses was widespread (43%), with the most common allied health therapies used in the preceding 12 months being chiropractic (37%) and physiotherapy (24%) (Meredith et al. 2011). Taken together, these studies have surveyed only owners/trainers of show jumping,
dressage and race-horses, who represent only a small sample of the whole equestrian industry. The equestrian industry comprises three distinct populations, broadly structured around the competitive disciplines organised by *Pony Clubs*, *Racing* jurisdictions, including harness and thoroughbred galloping, and *Sport-horse* organisations, which include horses that compete in the following events: show jumping, show hunters, eventing, dressage and endurance racing.

The aim of this project was to survey horse-carers (owners or trainers) from each of the three disciplines in the Auckland region about equine CAM, and explore the prevalence of use, perceived outcomes of treatment, the importance of various therapist attributes to them, and any factors influencing their decisions to use CAM.
Methodology

**Questionnaire design, development and study sample**

A questionnaire was developed for horse-carers, defined as the person (owner, trainer or another carer) who was mainly responsible for the care of one or more horses, to determine the prevalence of CAM use and attitudes towards CAM treatment practices for their horse(s). For the purpose of this study, CAM was broadly defined as any treatment not typically thought to be in the scope of practice for a veterinarian (or physician when referring to human use), and encompassed more mainstream disciplines such as physiotherapy and chiropractic medicine. All participants were over the age of 18 years, based in the Auckland region, a member of either a pony club, racing facility (harness or gallops) or sport-horse discipline, and caring for horse(s) competing in events covered by the New Zealand Equestrian Federation (NZEF), a federation which includes show jumping, show hunters, eventing, dressage and endurance racing. Any carers who were responsible only for horses that competed solely in polo, polo crosse, trekking, driving and/or hunting events, all of which have relatively low participation levels in NZ, and lack a single governing body through which participants could be contacted, were excluded from the study.

The questionnaire was designed as an online survey, which consisted of three sections. *Section 1* included demographic information, and questions assessing how many horses the carer was responsible for and the competitive equine discipline to which they belonged. *Section 2* covered the mode(s) of any CAM therapy used in the 12 months prior to the survey date, and questions related to the used therapies. *Section 3* asked about attitudes towards equine CAM therapy, and was answered by horse-carers who had or had not used equine CAM. The entire questionnaire was pilot tested on two to five people from each discipline, who were not included in the study sample.
Survey strategy and recruitment

Initial scoping of Auckland equestrian organisations was undertaken to calculate the size and distribution of the target population. Clubs and/or governing bodies from each of the three disciplines were selected in an attempt to gain a broad representative sample of the equestrian industry in the region. Because of the logistical set-up of the different equestrian organisations, the recruitment process differed for each of the three disciplines. The racing discipline involves smaller numbers of horse-carers than either of the other two disciplines. The governing organisation from the harness racing sector and the NZ Trainers Association from the galloping sector verbally agreed to send information about the study, and links to the online survey, to their members. Contacts from these groups represent almost all of harness racers in the region, and approximately 20% of gallopers. Pony clubs in New Zealand are invariably named as such and operate independently from each other and from other disciplines, including both child and adult riders and their horses. Three pony clubs, deemed to be representative, from different geographical locations around the Auckland region were selected to take part in this survey. These were one suburban club with 55 members, one semi-rural with approximately 115 members and one rural with 80 members. For the Sport-horse discipline, recruitment was undertaken via contacts who had electronic access to a broad sample of the population within the Auckland region. These included individuals known to the researcher and secretaries of some Auckland clubs, who sent emails about the study to all potential participants. Contacts who were distributing the online survey were followed-up with email and telephone reminders. After reading information about the study, participants were asked to indicate online whether they agreed to participate in the research, and then continued to complete the survey using SurveyMonkey (LLC, California) if they agreed. The study was ethically approved by the Unitec Research Ethics Committee. Data were collected between November 2010 and February 2011.
**Additional survey: Showjumping survey**

It was anticipated that a very low response rate in the online survey might result in a highly non-representative response in terms of CAM use prevalence, if only those individuals very interested in CAM completed it. To provide some indication about whether the history of CAM use was likely to be very different in non-respondents from respondents in the online survey, an additional anonymous survey investigating only the prevalence of CAM use amongst horse-carers was planned. Initial indications were of low response rates and this plan was consequently implemented. This short survey questioned 250 competitors at the Woodhill Equestrian Park 3-Star Showjumping competition on 10 March 2011. Showjumping is a part of the Sport-horse equestrian discipline, and competitor in this competition would have reflected a representative cross-section of adult owners/carers of Sport Horses in the Auckland region. Competitors were approached as they were attending to their horse(s) at their parked horse truck or stable. The survey asked competitors whether they had, in the last 12 months, used any of a comprehensive list of CAM therapies, excluding nutritional therapies.

**Data analysis**

Descriptive statistics were reported that pertained to prevalence of equine CAM use (from the showjumping study data), and data on modes, reasons for use, perceived benefits and attitudes towards CAM from the main study. ANOVA and Fisher’s least significance difference post-hoc tests, performed using SPSS version 18 (SPSS Inc., New York), were used to determine differences in prevalence among respondents from different equine disciplines and differences in importance ratings of sources of information about CAM and various practitioner attributes.
Results

**Part 1: Online Survey**

Response rate of the main online survey

From feedback from contacts who were distributing the questionnaire, it was possible to determine that approximately 682 horse-carers received the survey. This total was made up of 250 pony club members; 182 racehorse trainers, included 142 harness racing and 40 thoroughbred gallop racing; and 250 sport-horse competitors. Seventy-one people agreed to take part in the online survey, of whom 3 did not complete any part of the questionnaire, leaving a total of 68 respondents. Another 10 failed to complete much of the questionnaire and so their data were unavailable for many of the analyses. Most respondents (72%) described their involvement with horses as a sport-horse competitor, with fewer as pony club (15%) or race-horse (13%). Their characteristics by equestrian competitive discipline are shown in Table 1.

There were significant differences amongst horse-carers responding from the three different disciplines in age ($p = 0.047$ for overall ANOVA) and in number of horses per owner ($p < 0.001$), but not in the number of therapies used by a carer in the last year ($p = 0.7$; Table 1). Post-hoc analyses showed that race-horse-carers were older ($p = 0.02-0.03$) and owned more horses ($p < 0.001$) than carers of other types. A lower percentage of race-horse-carers had also used CAM for treatment of themselves, although this difference could have been due to chance selection characteristics and did not attain statistical significance ($p = 0.2$; Table 1).
Table 1: Characteristics of respondents by equestrian discipline

<table>
<thead>
<tr>
<th></th>
<th>Sport-horse</th>
<th>Pony Club</th>
<th>Racing</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female / Male</td>
<td>45 / 4</td>
<td>9 / 1</td>
<td>2 / 7</td>
<td>56 / 12</td>
</tr>
<tr>
<td>Age (years)</td>
<td>39.3 (14.1)</td>
<td>35.7 (14.4)</td>
<td>51.2 (16.2)</td>
<td>40.4 (14.9)</td>
</tr>
<tr>
<td>No. of horses under care</td>
<td>5.9 (7.5)</td>
<td>2.0 (1.4)</td>
<td>18.4 (11.9)</td>
<td>7.0 (8.9)</td>
</tr>
<tr>
<td>No. of therapies</td>
<td>2.1 (2.3)</td>
<td>2.1 (1.7)</td>
<td>2.0 (2.1)</td>
<td>2.1 (1.8)</td>
</tr>
<tr>
<td>No. of therapies excl. nutritional</td>
<td>1.8 (2.0)</td>
<td>1.5 (1.6)</td>
<td>1.6 (1.9)</td>
<td>1.6 (1.6)</td>
</tr>
<tr>
<td>No. past CAM users</td>
<td>39</td>
<td>8</td>
<td>7</td>
<td>54</td>
</tr>
<tr>
<td>No. past CAM users excl. nutritional</td>
<td>36</td>
<td>6</td>
<td>5</td>
<td>47</td>
</tr>
</tbody>
</table>

Values are frequencies for gender and number of past CAM users and mean (standard deviation) for other variables

* refers to number of different therapies used in the last 12 months and ** excluding nutritional therapies

* percent of those who responded that had used a non-veterinary therapy in the last 12 months and ** percent excluding individuals who had used only nutritional non-veterinary therapies

CAM therapies used

Fifty-four respondents (92%), of the 59 who completed this part of the survey (82% of all respondents) indicated that they had used at least one non-veterinary therapy in the last 12 months for the horse(s) they cared for (Table 2). When nutritional therapy was excluded from consideration there was little change to the data (total value 92% and excluding nutritional therapy 80%) (Table 2). Amongst users, CAM therapies were used 111 times in total from a reported 17 different modalities (Table 2). The most common therapies were physiotherapy (23%), nutritional therapy (18%), massage (14%), Bowen therapy (8%), chiropractic (8%) and homeopathy (8%). Nutritional therapy was not excluded from the online survey. Osteopathy had only been used by two participants in the last year (Table 2). Of treatment modalities that involve equipment or products owned and administered by the horse-carers, for example therapeutic equipment like some massage machines designed for use by the horse carer or nutritional therapy, the most frequently used were
supplements that were administered in the horses’ feeds and magnetic boots.

All respondents who had used CAM therapy perceived it to be at least somewhat beneficial for their horse. Some therapies used by only a single respondent were found to be highly beneficial, such as contact care, electrical muscle stimulation, hydrotherapy and thermotherapy. Additionally, every respondent, apart from one, with at least one horse that had veterinary care for the same reason as the CAM therapy reported almost always telling their vet that they used a CAM therapy. The exceptional respondent, who used nutritional therapy, reported that they never told their veterinarian about their CAM use.

It was common amongst horse-carers to use CAM to treat themselves. Rarely reported therapies (n=1) were invariably associated with use of human CAM use on themselves (Table 2). In contrast, 50-89% of people that used the more frequently used equine therapies (n≥8, including physiotherapy, massage and nutritional therapy) had also used CAM more commonly on themselves.
Table 2: CAM therapies used by respondents in the last 12 months

<table>
<thead>
<tr>
<th>Manual Therapy</th>
<th>CAM treatments per horse</th>
<th>Benefit of therapy</th>
<th>Self CAM use</th>
<th>Concurrent vet treatment</th>
<th>Inform vet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osteopathy</td>
<td>2</td>
<td>2.0 (1.4)</td>
<td>4.0 (1.4)</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>Physiotherapy</td>
<td>24</td>
<td>6.6 (5.7)</td>
<td>3.2 (2.7)</td>
<td>88</td>
<td>29</td>
</tr>
<tr>
<td>Chiropractic</td>
<td>8</td>
<td>3.9 (4.3)</td>
<td>3.8 (1.8)</td>
<td>63</td>
<td>13</td>
</tr>
<tr>
<td>Massage</td>
<td>15</td>
<td>9.3 (14.2)</td>
<td>2.7 (1.7)</td>
<td>80</td>
<td>13</td>
</tr>
<tr>
<td>Bowen therapy</td>
<td>8</td>
<td>4.4 (4.2)</td>
<td>3.0 (2.3)</td>
<td>50</td>
<td>13</td>
</tr>
<tr>
<td>Contact care</td>
<td>1</td>
<td>6.0</td>
<td>5.0</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Kinesiology</td>
<td>1</td>
<td>3.0</td>
<td>4.0</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Equine muscle release therapy</td>
<td>1</td>
<td>3.0</td>
<td>1.0</td>
<td>100</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Electrical / Magnetic</th>
<th>Magnetic therapy</th>
<th>Electrical muscle stimulation</th>
<th>Light therapy</th>
<th>Equissage machine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osteopathy</td>
<td>3</td>
<td>152 (185)</td>
<td>3.7 (0.6)</td>
<td>100</td>
</tr>
<tr>
<td>Physiotherapy</td>
<td>24</td>
<td>6.6 (5.7)</td>
<td>3.2 (2.7)</td>
<td>100</td>
</tr>
<tr>
<td>Manual Therapy</td>
<td>20</td>
<td>5.0</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Chiropractic</td>
<td>8</td>
<td>3.9 (4.3)</td>
<td>3.8 (1.8)</td>
<td>63</td>
</tr>
<tr>
<td>Massage</td>
<td>15</td>
<td>9.3 (14.2)</td>
<td>2.7 (1.7)</td>
<td>80</td>
</tr>
<tr>
<td>Bowen therapy</td>
<td>8</td>
<td>4.4 (4.2)</td>
<td>3.0 (2.3)</td>
<td>50</td>
</tr>
<tr>
<td>Contact care</td>
<td>1</td>
<td>6.0</td>
<td>5.0</td>
<td>100</td>
</tr>
<tr>
<td>Kinesiology</td>
<td>1</td>
<td>3.0</td>
<td>4.0</td>
<td>100</td>
</tr>
<tr>
<td>Equine muscle release therapy</td>
<td>1</td>
<td>3.0</td>
<td>1.0</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other</th>
<th>Nutritional</th>
<th>Homeopathy</th>
<th>Acupuncture</th>
<th>Hydrotherapy</th>
<th>Thermotherapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osteopathy</td>
<td>19</td>
<td>7</td>
<td>4</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Physiotherapy</td>
<td>369 (980)</td>
<td>7.1 (7.8)</td>
<td>16.5 (24)</td>
<td>21 (12.7)</td>
<td>10.0</td>
</tr>
<tr>
<td>Manual Therapy</td>
<td>3.5 (2.1)</td>
<td>3.9 (0.9)</td>
<td>4.8 (0.5)</td>
<td>5.0 (0)</td>
<td>5.0</td>
</tr>
<tr>
<td>Chiropractic</td>
<td>89</td>
<td>86</td>
<td>75</td>
<td>33</td>
<td>100</td>
</tr>
<tr>
<td>Massage</td>
<td>42</td>
<td>14</td>
<td>25</td>
<td>67</td>
<td>0</td>
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<tr>
<td>Bowen therapy</td>
<td>2.7 (1.3)</td>
<td>1.7 (1.3)</td>
<td>3.3 (0.5)</td>
<td>3.0 (0.0)</td>
<td>2.0</td>
</tr>
<tr>
<td>Contact care</td>
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<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Kinesiology</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Equine muscle release therapy</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Data are mean (standard deviation) unless otherwise stated
n= number of respondents using therapy
\[a\]Scale degree of benefit 1-5, (5= highly beneficial)
\[b\]Response to the question “Were any of the horses treated using this therapy also under veterinary care for the same condition that they were being treated?”
\[c\]Response to the question “Do you tell your vet that you use this CAM therapy on your horse(s)?” Score: 0= never, 1=rarely, 2= sometimes, 3= often, 4= always

Reasons for CAM use

Almost all (90%) of therapies had a reason provided for their use on carers’ horses. The underlying conditions treated with CAM were grouped into the following six categories: optimising performance, injury prophylaxis, behavioural problems and treatment of musculoskeletal problems, skin/coat conditions or other problems (Table 3).
Table 3: Number of respondents who reported CAM use

<table>
<thead>
<tr>
<th></th>
<th>Optimise performance</th>
<th>MSK problem</th>
<th>Injury prophylactic</th>
<th>Behavioural problems</th>
<th>Skin/coat condition</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manual Therapy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Osteopathy</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chiropractic</td>
<td>8</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Massage</td>
<td>18</td>
<td>11</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Bowen therapy</td>
<td>8</td>
<td>1</td>
<td>5</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Contact care</td>
<td>1</td>
<td></td>
<td></td>
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<td>1</td>
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<tr>
<td>Kinesiology</td>
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<td></td>
<td>1</td>
</tr>
<tr>
<td>Equine muscle release therapy</td>
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<td></td>
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<td>1</td>
</tr>
<tr>
<td><strong>Electrical / Magnetic</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnetic therapy</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Electrical muscle stimulation (EMS)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Light therapy</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Equissage machine</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nutritional</td>
<td>23</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Homeopathy</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Acupuncture</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydrotherapy</td>
<td>3</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thermotherapy</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

Indications for use were characterised in six groups listed at the top of the table.

n = number of respondents using therapy
MSK = musculoskeletal

Optimising the performance of respondents’ horse(s) included any reasons that were thought to increase a horse’s ability to perform, for example building muscle tone without stress on the horse’s legs, stating that horses seemed to race better for it, or that the therapy improved performance in disciplines other than racing. *Musculoskeletal* problems comprised any indications associated with an effect on the muscles, tendons, bones and joints, such as neck, back and hip problems, injury rehabilitation, and unstable hindquarters. The injury prophylaxis group comprised CAM use aimed at preventing injury, such as general check ups for wellbeing, maintenance treatments or treatments to improve circulation. Reasons to do with the demeanour of the horse(s), such as anxiety at shows, not travelling well and head shaking, as well as hormonal support for mood and relaxation were grouped under *behavioural* problems. Treatment for skin and coat conditions incorporated reasons such as stopping.
sweat rashes (by improving fluid intake whilst competing), improving overall skin and coat condition, and treatment for topical infections, wound healing, rashes and sun burn. The final group included non-specific reasons for treatment, such as a positive experience or reputation of a practitioner or treatment, and use as a last resort.

Musculoskeletal problems were the main reason (62%) for therapy use, especially for manual therapies; however, these therapies were also used as an injury prophylaxis and to optimise performance in 10% of cases (Table 4). Nutritional therapy was used for the widest range of indications, including reasons from each of the six categories; although *behavioural, musculoskeletal problems* and *optimising performance* were the most common reasons for nutritional CAM use.

Overall, there was a difference in the ratings of importance in carers’ decisions to use CAM therapy amongst different sources of information (p < 0.001; Table 4). Post-hoc tests revealed that “word-of-mouth” and “own readings” were ranked as more important than other sources of information (p = 0.01). Vet recommendation, knowing the therapist and direct marketing each had progressively lower rankings (p = 0.05). Although reported by only three respondents, hydrotherapy appeared to be an exception. For this therapy, knowing the practitioner ranked with greater importance, most likely due to the fact that these respondents would be located close to or know the owner of the equine pool.

**Table 4: Importance of information about the practitioner in respondents’ decisions to consult them**

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>WOM</th>
<th>Own reading</th>
<th>Vet recommended</th>
<th>Know practitioner</th>
<th>Direct marketing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual Therapy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Data is mean (standard deviation). Score: 0 = not important at all, 2 = moderately important, 4 = highly important
Abbreviations for importance of sources of information about the practitioner are as follows:
WOM, Word of mouth recommendations; personally knowing the practitioner; practitioners have previously approached respondent and/or informed them of their therapy and training
n = number of respondents using therapy

### Practitioner Attributes

There were differences in ratings of importance amongst various practitioner attributes (p < 0.001) for overall ANOVA; Table 5). Post-hoc comparisons showed that the reputation of the practitioner and the practitioner’s practical experience with animals were more highly scored attributes than any others (p < 0.003 for all comparisons) and that having a veterinary degree along with qualification in the other form of treatment scored lower than any other attribute was ranked significantly lower than all other attributes (p < 0.001 for all comparisons).

### Table 5: Importance of practitioner’s qualifications/skills for selection of specific attributes for each therapy practitioner

| Osteopathy | 2 | 4.0 (0.0) | 3.0 (0.0) | 2.0 (2.8) | 2.5 (0.7) | 1.0 (1.4) |
| Physiotherapy | 24 | 3.3 (1.1) | 3.5 (0.8) | 3.1 (1.3) | 2.4 (1.6) | 1.2 (1.4) |
| Chiropractic | 8 | 3.0 (1.4) | 2.9 (1.5) | 1.6 (1.8) | 2.0 (1.5) | 0.9 (1.0) |
| Massage | 18 | 3.2 (1.0) | 2.4 (1.0) | 2.7 (1.7) | 2.2 (1.2) | 1.4 (1.0) |
| Bowen therapy | 8 | 3.0 (0.9) | 2.5 (1.5) | 2.6 (1.3) | 2.3 (1.4) | 1.8 (1.6) |
| Contact care | 1 | 4.0 | 4.0 | 0.0 | 0.0 | 0.0 |
| Kinesiology | 1 | 4.0 | 4.0 | 0.0 | 2.0 | 3.0 |
| Equine muscle release therapy | 1 | 4.0 | 4.0 | 3.0 | 4.0 | 4.0 |
| **Electrical / Magnetic** | | | | | | |
| Magnetic therapy | 3 | 3.3 (1.2) | 3.7 (0.6) | 2.3 (2.1) | 0.5 (0.7) | 0.5 (0.7) |
| Electrical muscle stimulation | 1 | 4.0 | 4.0 | 4.0 | | |
| Light therapy | 4 | 3.5 (1.0) | 3.8 (0.5) | 2.3 (2.1) | 0.0 | 0.0 (0.0) |
| Equissage machine | 2 | 2.5 (0.7) | 3.5 (0.7) | 2.5 (0.7) | 2.0 (2.8) | 3.0 (0.0) |
| **Other** | | | | | | |
| Nutritional | 23 | 3.3 (0.8) | 3.6 (0.6) | 3.3 (0.9) | 1.8 (1.4) | 1.6 (1.2) |
| Homeopathy | 7 | 3.1 (0.9) | 3.5 (0.8) | 1.9 (1.3) | 1.7 (1.6) | 1.4 (1.3) |
| Acupuncture | 4 | 4.0 (0.0) | 3.7 (0.6) | 2.3 (1.7) | 3.0 (1.0) | 1.7 (0.6) |
| Hydrotherapy | 3 | 3.3 (1.2) | 3.3 (1.2) | 3.3 (1.2) | 4.0 (0.0) | 2.0 (2.8) |
| Thermotherapy | 1 | 4.0 | 0.0 | 4.0 | 0.0 | |
| **Total mean (SD)** | 111 | 3.3 (0.9) | 3.2 (1.0) | 2.6 (1.5) | 2.1 (1.5) | 1.4 (1.3) |

**n** Good Animal Animal Approved Vet degree +
A total of 31 different therapists were named and 13 (42%) formal qualifications were identified. Of the 121 therapies reported, 20% of respondents stated the qualification of the practitioner. However, nine people reported applying therapies themselves, such as use of the equissage machine or the use of massage on their horse. Only 9% of nutritional therapy users stated the qualification of their therapist, though 26% gave the therapists’ names. Seven different physiotherapists were named, all of whom had regular human-physiotherapy qualifications as well as animal qualifications. Five practitioners had veterinary degrees along with an animal complementary therapy qualification, either in acupuncture, physiotherapy, massage or nutrition.
Horse-carers’ views about CAM statements

All participants were asked questions relating to their attitudes to CAM. Since only four of the five non-equine CAM users completed this item the vast majority of respondents who completed this section were CAM users so didn’t change results by including them in the analysis. The majority of respondents (94%) agreed or strongly agreed with the statement that they had heard that these therapies could be used on horses, with only 6% (3/51) of respondents adopting a neutral stance (neither agreed nor disagreed) and none disagreeing or strongly disagreeing (Table 6). The majority (96%) of respondents also agreed or somewhat agreed with the statement about believing some CAM therapies are likely to be beneficial for horses with only 4% (2/54) taking a neutral stance. More than half the respondents (56%) either agreed somewhat or strongly agreed that their horses had conditions for which CAM therapy was needed, whilst 20% disagreed somewhat (12%) or strongly disagreed (8%). Approximately one third of respondents (34%) agreed somewhat with the statement that vets are the best person to decide what is best for their horse’s health, whereas 25% neither agreed nor disagreed, 19% disagreed somewhat, 15% strongly agreed and 6% strongly disagreed. In relation to the statement “equine CAM is too expensive for me”, 32% of respondents neither agreed nor disagreed, 25% disagreed somewhat, 19% somewhat agreed and 17% strongly disagreed. Most respondents (84%) took a neutral stance (disagreed somewhat or neither agreed nor disagreed) with the statement that CAM therapists were conveniently located for them.
Table 6: Respondents who had and had not used a manual CAM therapy (Osteo, Physio, Chiro) and their response to rating how strongly they agreed with statements about CAM

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>N</th>
<th>n unsure</th>
</tr>
</thead>
<tbody>
<tr>
<td>The horse(s) I care for have conditions for which CAM was needed</td>
<td>4.4</td>
<td>0.8</td>
<td>54</td>
<td>0</td>
</tr>
<tr>
<td>Believe that at least some CAM therapy are likely to be beneficial for horses</td>
<td>4.6</td>
<td>0.6</td>
<td>54</td>
<td>0</td>
</tr>
<tr>
<td>I had heard that these therapies could be used on horses</td>
<td>4.7</td>
<td>0.6</td>
<td>51</td>
<td>1</td>
</tr>
<tr>
<td>Vets have more knowledge then other equine therapy practitioners</td>
<td>3.6</td>
<td>1.2</td>
<td>50</td>
<td>4</td>
</tr>
<tr>
<td>Vets are best person to decide what’s best for horse health</td>
<td>3.3</td>
<td>1.1</td>
<td>52</td>
<td>2</td>
</tr>
<tr>
<td>Equine CAM therapies are too expensive for me</td>
<td>2.8</td>
<td>1.2</td>
<td>53</td>
<td>0</td>
</tr>
<tr>
<td>Equine CAM therapists are conveniently located for me</td>
<td>3.4</td>
<td>1.0</td>
<td>52</td>
<td>2</td>
</tr>
</tbody>
</table>

The data represents responses to the question “please indicate how strongly you agree with the following statements about equine CAM focusing more on manual therapies (hands on) such as osteopathy, physiotherapy, chiropractic, Bowen therapy” Using this scoring system: 1 = strongly disagree, 2 = disagree somewhat, 3 = neither agree nor disagree, 4 = agree somewhat, 5 = strongly agree

In order to find out the proportion of equine carers who would use a particular therapy for particular equine symptoms, various conditions were identified from a previous study, and respondents were able to select multiple therapies that they thought may be beneficial for the particular problem (Table 7). For the purpose of this analysis, the equine symptoms and conditions were characterised by the researcher as Musculoskeletal, Other and Behavioural. The therapies were grouped as, Manual Therapies and Other, Vet and None, to help summarise the findings.

Table 7 indicates the total possible individual treatment options for specific conditions, rather than indicating what horse-carers have used in the past. On average, 35% of people would take their horse to a manual therapist for a musculoskeletal problem, with physiotherapy being the most frequently selected modality, followed by massage and chiropractic treatment. Twenty nine percent of respondents on average would use acupuncture, homeopathy and natural remedies for behavioural problems and other disorders.
Table 7: The proportion (%) of equine carers who indicated that, they would use a particular therapy/medicine

<table>
<thead>
<tr>
<th>Manual Therapies</th>
<th>Vet</th>
<th>Other</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>Massage</td>
<td>23</td>
<td>26</td>
<td>21</td>
</tr>
<tr>
<td>Chiropractic</td>
<td>55</td>
<td>43</td>
<td>28</td>
</tr>
<tr>
<td>Osteopathy</td>
<td>52</td>
<td>29</td>
<td>27</td>
</tr>
<tr>
<td>Physiotherapy</td>
<td>14</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>Veterinary treatment</td>
<td>54</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>Acupuncture</td>
<td>20</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Homeopathy</td>
<td>4</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Natural remedies</td>
<td>38</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Do nothing</td>
<td>12</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>MSK disorders</td>
<td>Tying-up</td>
<td>Chronic respiratory disorders</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Rehabilitation post-operative</td>
<td>38</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Loss of condition/wellbeing</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>Travelling problems</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Temperament change</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Loss of performance</td>
<td>27</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Rearing/bucking</td>
<td>42</td>
<td>33</td>
</tr>
</tbody>
</table>

The conditions were compiled from various literature sources, all of which appeared to be commonly reported problems in the horse (Attenborrow, 1982; Jeffcott, 1975, 1979, 1980; Griffiths, 1997 as cited in Webb, 2005).

Table 8 indicates the proportion (%) of equine carers who indicated that, they would use a particular therapy/medicine for particular equine symptoms/medical problems if they felt their horse could benefit. MSK= musculoskeletal

Part 2: Showjumping survey

A total of 192 horse-carers from approximately 250 pre-entered competitors completed the survey. All those approached agreed to take part. Of the 192 respondents, 169 (88%) had used one form of CAM other than nutritional therapy in the last 12 months. All participants selected only one type of
Manual therapies were the most commonly used, with physiotherapy being the most reported modality (Table 8).

**Table 8: CAM treatment modality used by carers of showjumping horses over a set 12 month period (users and non-users included)**

<table>
<thead>
<tr>
<th>Therapy</th>
<th>Number of users (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osteopathy</td>
<td>18 (9)</td>
</tr>
<tr>
<td>Physiotherapy</td>
<td>53 (28)</td>
</tr>
<tr>
<td>Chiropractic</td>
<td>14 (7)</td>
</tr>
<tr>
<td>Massage</td>
<td>24 (13)</td>
</tr>
<tr>
<td>Bowen Therapy</td>
<td>27 (14)</td>
</tr>
<tr>
<td>Acupuncture</td>
<td>7 (4)</td>
</tr>
<tr>
<td>Acupressure</td>
<td>0</td>
</tr>
<tr>
<td>Homeopathy</td>
<td>4 (2)</td>
</tr>
<tr>
<td>Magnetic Therapy</td>
<td>4 (2)</td>
</tr>
<tr>
<td>Ultrasound</td>
<td>7 (4)</td>
</tr>
<tr>
<td>Aromatherapy</td>
<td>0</td>
</tr>
<tr>
<td>Thermotherapy</td>
<td>0</td>
</tr>
<tr>
<td>Hydrotherapy</td>
<td>4 (2)</td>
</tr>
<tr>
<td>Equine Telepath</td>
<td>0</td>
</tr>
<tr>
<td>Hyperbaric oxygen chamber</td>
<td>0</td>
</tr>
<tr>
<td>Electrical muscle stimulation</td>
<td>0</td>
</tr>
<tr>
<td>Laser Therapy (bioproton light therapy)</td>
<td>0</td>
</tr>
<tr>
<td>Photon Therapy (colour therapy)</td>
<td>3 (1.5)</td>
</tr>
<tr>
<td>Equine Touch Therapy</td>
<td>4 (2)</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>192</strong></td>
</tr>
</tbody>
</table>

Participants each selected only a single therapy that they had used in the past.
Discussion

Prevalence of CAM use

The present study suggests that the use of equine CAM was prevalent within the equine disciplines surveyed. A high percentage of respondents (92%) in the main (online) survey also indicated that they had used equine CAM, and this proportion remained high (80%) when use of nutritional therapies were excluded. Pony Club members had used CAM the most (80%), followed by Sport Horse (95%) and Racing (88%). The proportion of people completing the online survey was very low (<10%) and this might have resulted in a gross over-estimation of CAM users amongst Auckland horse owners and trainers if only people who were very interested in equine CAM completed it. However, results of the Show Jumping questionnaire tend to confirm a very high prevalence of use. Response rates in this survey were very high because competitors were interviewed in one communal assembly point. The exact proportion of all competitors who completed this survey was difficult to establish, due to unknown numbers of multiple entries from within the same family and numbers of late entries or riders who had pre-entered but did not turn up to compete. In this Show Jumping survey, respondents might actually have used more than one CAM therapy, and due to time constraints they only were able to select one. However, a likely estimation from the approximately 250 pre-entered competitors, showed a high proportion of people completed the Show Jumping survey, approximately 77% response rate. A limitation of this survey is that it was only applied at a simple competition of the sport horse industry, however, the event could possibly be representative cross-section of Auckland adult show jumping. The prevalence was high, as in the online survey of sport horse with the vast majority of show jumping owners/competitors (88%) had used some form of CAM for their horse in the past.

Although the response rate was lower from respondents caring for pony club or racing horses, online survey data suggest that a similarly high proportion of
pony club horse-carers and around half of racing horse-carers had also recently used CAM.

In this survey’s results, the extent and range of equine CAM use amongst horse-carers is in line with past research in the area, especially comparable to a recently published similar survey of 110 horse owners from the North Island of NZ by Meredith *et al.* (2011). Whereas the present study data showed that 82-92% of surveyed horse-carers from across the equestrian event spectrum had used CAM to treat their horse in the last year, the Meredith *et al.* (2011) study showed 67% of horse owners had used allied health therapies within the same time frame. The slightly lower prevalence in the Meredith *et al.* study compared to the present study could be due to the different disciplines surveyed. Meredith *et al.* (2011) surveyed dressage, showjumping and thoroughbred gallop racing, and did not include pony club (in which there was a high prevalence of use indicated by present study data), other sport-horse disciplines, such as endurance riding and eventing, or thoroughbred harness racing, which were all included in the present study. It is unlikely differences were due to changing attitudes as both studies were carried out approximately only a year apart.

Another possible reason for differences in results noted in the present study and those found by Meredith *et al.* (2011) could be the differences in sampling and survey methods used. Although neither study employed random sampling, the Meredith *et al.* (2011) study interviewed horse-carers using a face-to-face survey at two showjumping and dressage competitions in Dannevirke and Hawera in the North Island of NZ, along with thoroughbred trainers within Manawatu and Wanganui. A comparison of response rates from the online and show-jumping survey from the present study show that face-to-face interviewing resulted in markedly higher response rates than using online methods. Face-to-face interviewing may also increase the completeness of data as it is easier for participants to skip or misunderstand questions online. Meredith *et al.* (2011) used face-to-face interviewing, and this appears to have resulted in a higher response rate (approximately 63%) than the present study. Consequently, the observed lower prevalence
reported by Meredith et al. (2011) compared to the present study may have been due to reduced sampling bias from the higher level of response, or could simply have reflected regional differences in practice, as the Meredith et al. study was based in the more rural central and lower North Island regions compared to the semi-urban Auckland areas in this study.

It is also possible that the proportion of CAM users is overestimated in both surveys of the present study due to social desirability bias or the tendency of respondents to answer questions in a manner that would be viewed favourably by the surveyor (Leal 1999). If participants had known the research was an osteopath interested in equine CAM, in the show jumping survey similarly to the Meredith study considering the study was undertaken by equine physiotherapists who may be perceived as holding more mainstream veterinary views. Social desirability bias is likely to be greater in a face-to-face interview as used by Meredith et al. and in the Show Jumping survey than an online survey therefore it is possible that data from both studies overestimate the actual prevalence of CAM use to an extent.

Overall, despite differences in response rates between surveys within the two studies and possible overestimation from non-response and social desirability bias, all results indicate that CAM use by horse-carers for their horses is likely to be highly prevalent in NZ.

The difference in prevalence between disciplines, given the available evidence, the carers of sport-horse and pony club disciplines use CAM the most. Approximately 85% of these carers used CAM, compared with fewer than 50% of race-horse trainers using CAM. This is similar to results from the Meredith et al. (2011) study, which also indicates a high percentage of use in the sport-horse group; 72% of show jumpers and 66% of dressage respondents had used allied health therapists, and were more likely to use allied therapies compared with race-horse trainers (43%). Coleman et al. (2006) also reported a relatively lower prevalence of CAM use in their survey of 23 race-horse carers. It is of note that race-horse trainers were, on average, were older than horse-carers of the other disciplines and were
predominantly male. However, this Coleman et al. study with 23 participants is probably unreliable. Males, compared to females less frequently use CAM on themselves (Bishop and Lewith 2010), and this may parallel attitudes to use on horses. Data from the present study clearly establish that horse-carers within the equine industry commonly use CAM. It seems likely that horse-carers from all three disciplines have used CAM and are likely to use it again, as the used therapies were rated highly beneficial.

**Range of therapies used**

A number of different therapies were reported in this study. Seventeen different CAM therapies were identified in the online survey, in comparison to the fewer 11 therapies identified in another NZ study by Coleman et al. (2006) questioning race-horse trainers. The reason why less CAM therapies were identified in the race-horse study compared to the present online survey could be due to sample size: only 23 race-horse trainers were surveyed in the Coleman et al. (2006) study, compared with 68 mixed-disciplined horse-carers in the present study. However, since race horse owners have more horses each but report using the same number of different therapies, it is also possible that race-horses are actually subjected to a much smaller range of therapies than other types of horses. Of the different CAM therapies reported in the online survey manual therapies, including physiotherapy, massage, Bowen therapy and chiropractic; along with nutritional therapy were used by most respondents. This is similar to data from the additional showjumping survey, which also showed that the most frequently reported therapies used were physiotherapy, Bowen and massage. It is possible that the number of therapies used by respondents in the showjumping survey was underestimated; the average number of therapies reported to have been used was 1 compared to 92% in the online survey. Participants in the showjumping survey were under time pressure and may not have taken as much time to look through the entire list of therapies. Coleman, et al. (2006) also found that physiotherapy, massage and chiropractic were the most commonly used CAM
modalities. In contrast with the observation of more frequent use of physiotherapy than chiropractic therapy by Coleman et al. (2006) and in the present study, Meredith et al. (2011) found that chiropractic treatment was the most commonly used therapy, followed by physiotherapy. Investigation of differences between equine disciplines by Meredith et al. (2011) revealed that dressage and race-horse trainers favoured chiropractic treatment, whilst showjumping riders primarily used physiotherapy, similarly to the present study. The reason why this present study may have nutritional, Bowen and homeopathy as highly prevalent in comparison to the Meredith et al. (2011) study could be because the latter mainly focused on the use of allied (complementary) health therapies, as opposed to alternative therapy, whilst this present study included both complementary and alternative therapy, which may have been viewed to encompass a greater range of practices including nutritional therapy. Due to the similarities in findings about relative use of specific therapies from Meredith et al. (2011), Coleman et al. (2006) and the present study, it could be reasonably generalised that physiotherapy, massage and chiropractic are the most commonly used therapies in the equestrian industry at the moment.

Nutritional therapy was the second most used modality in the present study. Some ambiguity about the term ‘nutritional’ therapy was evident from responses; it was unclear whether it included or excluded such treatments as supplements, herbal remedies, some medicines and additional feeds. In order to clarify the meaning of this term for the purposes of the online survey, a statement was added to the question indicating that supplements and herbal remedies were to be included. Despite this statement, there may still have been some differences between the respondents’ interpretations of nutritional therapy. For example, some respondents included additional feeds, such as grains or extra hay as nutritional therapy, although this interpretation was not intended. This ambiguity was noted by some respondents in the free text field or as additional notes, since many competitive horses, especially thoroughbreds, receive additional feeds at least once a day, with high performance horses or stalled horses getting feed up to three times a day (Lardy and Poland 2011). These additional feeds would just be included as
part of the horse’s diet, and not technically a dietary supplement. An exception would be if they indicated the addition of supplements like garlic to the extra feed, in which case ‘nutritional’ therapy would have been recorded by the researcher as garlic. Therefore, these additional feeds do not fall under the definition of CAM for this study. Due to the reasons of ambiguity, nutritional therapy was excluded from the showjumping survey in order to make the results more applicable to CAM and data including and excluding nutritional therapy in the online survey are reported. Although, it seems that there is limited regional variation in management for horses, including feeding, as Meredith et al. (2011) acknowledged two previous surveys of the racing industry about the feeding management of thoroughbreds and yearlings in NZ. Therefore, slightly different answers that respondents put down about nutritional feeds may not limit the ability to generalise the most commonly used therapies, as it is suggested that there is limited variation in management and, horse-carers may use similar approaches in selected therapies for their horses. Despite this statement, these acknowledged studies by Meredith et al. (2011) were limited to the racing industry and not the entire equine industry.

There were no differences amongst horse-carers from the three different disciplines in the number of different therapies used by a carer for their horse(s) in the last year. Interpretation of this could be limited by the possibility that some disciplines were not representative due to the sampling procedure and modest response to the online survey.

**Common use of CAM**

The most common reason for using CAM was for musculoskeletal problems, especially for treatment with manual therapies. Some of these most common problems included back and neck problems along with lameness. Musculoskeletal problems such as back and neck problems are suggested to be often related to lameness (Alvarez et al. 2008). Alvarez et al.(2008) refer to two studies that show the close relationship between back and limb
function, a topic which has been investigated to some extent. One of the two studies authored by Landman et al. (2004) found lameness and associated back pain in 26% of the 805 cases presenting with orthopaedic problems, and the other study by Dyson (2005) observed concurrent forelimb and hind limb lameness in 46% of horses with thoracolumbar or sacroiliac pain. In a human study on CAM use, musculoskeletal problems were also the most common reason for adults and children to use CAM (Beychok, 2009). Therefore, it could have been expected that these problems would also be the most commonly reported for horses. The findings about indications for use were also in agreement with Meredith et al. (2011), who showed that horse-carers utilised CAM therapy for back problems and lameness. The other NZ study, by Coleman et al., did not address reasons for CAM use. Along with musculoskeletal problems, injuries, optimising performance and preventing injury were also commonly reported reasons for CAM use. Overall, it seems that indications for animal CAM use follow similar trends to human CAM.

**Information about CAM**

Users of CAM in the online survey generally reported that they found CAM to be beneficial for their horse. This result is in agreement with the Colman et al. (2006) study which showed trainers felt that alternative therapists were more “specific” as they focused on a number of factors, rather than just one, that could be contributing to the injury, by treating the cause instead of only the symptoms. Assessing the treatment benefits through asking the horse carer is likely to be reliable, since an 11-week physiotherapy intervention showed that carers are good at judging improvement or changes in their horses’ improvements (Craig et al. 2006). The method used to establish this was by comparing objectively measured improvements of the spinal flexion in the horse and simultaneously gathered subjective ratings of improved flexibility by the horse-carers. The close knowledge carers seem to have about their horse health is also mirrored in the fact that many of the respondents in the online survey had heard that at least some of the 20 therapies could be used on
horses. This knowledge could indicate that horse-carers are relatively informed about equine CAM therapies.

Self-use of CAM among horse-carers, who in the present study had almost exclusively used CAM for their horses, was common. The online survey found that a lower percentage of race-horse-carers used CAM for treatment on themselves, when compared with carers from the other equine disciplines. The respondents who used CAM on themselves, were mainly from the sport-horse and pony club groups, tended to be female, and had an average age of 40 years. Similar findings are also reported from human studies about CAM use, with data indicating that people who use CAM on themselves also tend to be female and of middle age (Beychok 2009; Bishop and Lewith, 2010). Since most CAM users in the present study found CAM therapy to be beneficial for their horses, and many had also used CAM to treat themselves, it is possible that perceptions about CAM transfer between attitudes to human or veterinary CAM, including perceptions about the likely effects of certain CAM modalities. For example people who have had a good experience with CAM treatment themselves could be more likely to use CAM to treat their horse and find the treatment beneficial, or vice versa.

Another interesting finding from the online survey data is that there were mixed opinions about whether veterinarians were the best person to decide what is best for their horse’s health. This lack of overall agreement may show that people have some faith in the equine CAM therapist’s decision, and think that, as horse-carers, they have the ability to decide what is best for their horse(s) health, as they believe they know when their own horse’s health is not as it should be. This decision making is an interesting topic, as people in NZ have the right to choose a CAM therapy for their horse. In comparison, laws require CAM therapists’ in the UK and USA so that horse-carers can only use a qualified and registered CAM therapist for the treatment on their horse, and the CAM therapist has to be referred to by a veterinarian (Pusey et al. 2010).
CAM practitioners

A review by Haussler (2009) found that there were individuals claiming to be ‘equine alternative therapy practitioners’, but lacking formal training or licensing in the required areas, and indicated that this was undesirable. Of the 31 different therapists identified in the present study’s online survey, respondents stated 13 of these therapists (42%) had a formal qualification. However, compared to the present study, the study by Coleman, et al. (2006), though a lesser number of alternative therapies were reported to be used, showing that 7 out of 16 (44%) practitioners had known qualifications. Considering this only two people were concerned about qualifications in the Coleman et al. (2006) study, and likewise, most horse-carers included in the present study selected their CAM therapy/therapists based on recommendation, and not on the level or type of qualification. In fact, many of the horse-carers may not have even been aware of the therapist’s qualification as they left the question blank. The respondents’ lack of knowledge about the practitioner’s qualifications is interesting in itself, and could indicate the described interest in CAM use is based on the perceived effectiveness of the treatment, rather than formal qualifications of its practitioners. Because respondents were apparently unconcerned and unaware of qualifications, there is a possibility that more therapists than indicated actually held formal qualifications. This present study may have allowed participant the time to look up the qualifications for example, by using the internet or the therapist’s business card, due to the fact that the survey was done online. However, despite this, results agreed with the Coleman et al. (2006). Even though participants ranked their interested in the CAM practitioners’ reputation and effectiveness of their treatment over level of qualification does not necessarily mean they would disregard a practitioners’ credentials.
**Limitations of study**

Surveys of horse owners in economically developed nation’s present difficulties due to the diversity of the equine industry. Although the industry can be broadly divided into professional/competitive and leisure activities, in reality the participants cannot be exclusively divided into these sectors. There are strong linkages and significant overlaps between sectors that cannot be ignored. The present survey investigates some competitive horse riding such as sport-horse and racing, with pony club members not always being competitive. This study does not extend to all leisure riders as this was not the aim of the study. However, when beginning this present study, there had been no research discussing the prevalence of CAM use across this range of equine groups in New Zealand. One of the main limitation is that this research was only conducted in the Auckland region only and even though it covers a broad range of the equestrian industry its small sample size makes it hard to generalise it to the rest of NZ or other countries.

A consistent short-coming for animal CAM studies is the small sample size. Based on the statistical calculations, the ability to detect differences in CAM use between equine competitive disciplines determined that 102 participants per group would be required to detect meaningful differences in the prevalence of CAM use amongst equine disciplines using Fisher’s exact test (Faul *et al.* 2007). In order to obtain a representative view of the three disciplines, and to meet the sample size required for the statistical power calculations above, an approach to approximately 150-200 potential participants from each of the three disciplines was proposed, with an aim of achieving a 50-60% response rate. However, the study with 71 participants fell far short of the recommended number of 300 participants.

Initially, this study aimed to achieve a larger response rate from each discipline, thus it was more logical to use an online questionnaire. Undertaking the additional showjumping survey allowed greater confidence in
results about the prevalence of use due to its high response rate. Therefore, as the additional showjumping survey was carried out face-to-face, and even though it may require greater resources, face-to-face interviews for the main survey, as well as or instead of the online questionnaire, could have increased the response rate, and potentially the representativeness of respondents. Another thing that could have helped the response rate of the main survey could have been if the questionnaire contained less questions and was more to the point.

Due to the low response rate, a good cross-section of the Sport-horse competitors, Pony Club members and Racing trainers was not reached. Therefore, comparing and contrasting between each group is difficult, and the limited data make it harder to generalise the information to the entire equestrian industry. During the planning of this study, the frequency of CAM use was to be assessed more in-depth but due to the lack of people per horse, this was not achieved. However, the attitudes of respondents had not been discussed in literature before and so this study was able to develop this.

Due to the fact that many people have now have email addresses, the questionnaire may have been forwarded to people that it was not intended for. Response bias may have been increased through forwarding of the questionnaire amongst friends or family members with similar experiences and attitudes.

**Further research**

The results of the analysis are a representation of the particular sample of horse-carers in Auckland, and cannot necessarily be generalised to the whole population of horse-carers in New Zealand, which include those caring for horses involved in other sports such as polo and leisure riding. Further development of the questionnaire could be completed to increase its usability, and aid further studies that might randomly select horse-carers from the three equestrian disciplines, while providing a sufficient incentive for horse-carers to
respond. Information gained from a large study would be an important source of information for the New Zealand equine industry, with evidence on what CAM therapies carers are using and finding beneficial, possibly allowing them to provide more efficient horse health care. Face-to-face interviews with some open-ended questions may help to assess the attitudes and opinions better than closed questions.

Further areas of interest could be identifying whether the level of horse-carers, riders, or horses affected prevalence of use and attitudes towards equine CAM. The level of rider, for example, could range from professional to beginner level, whereas horses can compete in top grand-prix classes even though some if its riders may not. At a beginner’s level, the horse-carers do not rely heavily on their horses to perform to the same degree as at Olympic level (McGowan et al. 2007). This might mean the horse carers could be less likely to spend money on treatment.

It has been proposed in the past that further studies to investigate the effectiveness of CAM on horses are still warranted, and it could be said that the predicament hasn’t changed. Further research is needed to assess the effectiveness of specific CAM therapies, especially in pain management and selected lameness conditions. Improved training standards of therapist will ensure that the service provided continues to develop for the benefit of the horse.

**Conclusions**

The current study has provided data suggesting widespread use of equine CAM among pony club members, sport-horse competitors and race-horse-carers in Auckland. Respondents here were invariably past CAM users and many claimed to have used a variety of manual therapies, electrical/magnetic therapies and other CAM therapies for a variety of problems and believed them to be at least somewhat beneficial. Horse-carers seemed to place higher importance on the practitioner’s reputation and practical experiences with animals compared to having a formal qualification.
This study explored the behaviours and attitudes of horse-carers surrounding the use of equine complementary and alternative medicine (CAM). Dissemination of this information may raise awareness about available treatments and their perceived outcome, thus providing both horse-carers and equine health practitioners with information that could benefit the welfare of their horses.
**References**


Lardy G, and Poland C. Feeding management for horse owners., North Dakota State University. from [http://www.ag.ndsu.edu/pubs/anisci/horse/as953w.htm](http://www.ag.ndsu.edu/pubs/anisci/horse/as953w.htm), 2011


Poynton L, Dowell A, Dew K, and Egan T. General practitioners’ attitudes toward (and use of) complementary and alternative medicine: a New


Webb A. The referral practices of equine veterinarians to complementary therapies., UNITEC, Auckland, 2005


Section 3: Appendices
Appendix A: Ethics approval for this project

Natalie Knight
1B Harbutt Ave
Mt Albert
Auckland 1025

23 November 2010

Dear Natalie

Your file number for this application: 2010-1123
Title: The prevalence of use and attitudes of horse carers towards equine complementary and alternative therapies

Your application for ethics approval has been reviewed by the Unitec Research Ethics Committee (UREC) and has been approved for the following period:

Start date: 28 October 2010
Finish date: 27 October 2011

Please note that:
1. the above dates must be referred to on the information AND consent forms given to all participants
2. you must inform UREC, in advance, of any ethically-relevant deviation in the project. This may require additional approval.

You may now commence your research according to the protocols approved by UREC. We wish you every success with your project.

Yours sincerely

Lyndon Walker
Deputy Chair, UREC

cc: Catherine Bacon
Cynthia Almeida
Appendix B: Online survey

1. Introduction

My name is Natalie Knight and I am currently in the fourth year of a programme in Osteopathy at Unitec. Part of my two year Master of Osteopathy degree requires me to complete a research thesis. My research project is to investigate the prevalence of use and attitudes of horse carers (either owners, trainers or another person) towards equine Complementary and Alternative Medicine (CAM). CAM refers to any non-veterinary therapy or treatment given to a horse to treat or alleviate symptoms of an illness, improve health or prevent a disease or condition. You are invited to take part in this study by completing an on-line questionnaire.

- Note that both CAM users and non-users are being surveyed, so please read on
- To be eligible to participate in this study, you must be over the age of 18 and responsible for making the decisions for the care of horse(s) based in the Auckland region are eligible. In addition, to be eligible you must also be either a pony club member, racing horse owner or trainer, or sport horse (includes show jumping, show hunting, eventing, dressage, and endurance racing) competitor or trainer.
- This study has been approved by the Unitec Research Ethics Committee.

What we are doing:

With the help of my research supervisors we are trying to find out about how many equine carers use CAM therapies for their horses, the reasons or medical problems associated with specific CAM modalities used or reasons for non-use, and your view of the outcomes following use. Because we want to know the proportion of people who use CAM for their horses and reasons why people may not use it, it is really important that both people who have and those who have not used CAM therapies for their horses respond to this survey. Currently, very little information has been published about the use of equine CAM in the NZ equestrian industry. This survey will explore various CAM therapies that are available and their potential use in equine health care.

What it will mean for you:

If you continue on to fill out this survey you will be asked to tick the consent form and will be asked to complete only one online questionnaire as best you can.

If you HAVE used an equine CAM modality for your horse in the last 12 months then you will be asked to provide some information regarding the therapy such as what it was and asked to rate how beneficial it was, this should take approximately 10-15mins. If you have NEVER used an equine CAM before then it will be very quick to fill out (5 min max).

- If you complete the questionnaire within the time-frame allowed for the study, you will go in the draw to win an iPod!

Your name and any information that may identify you will be kept completely confidential. All information collected from you will be stored on a password protected file or locked filing cabinet and only you, my two supervisors and I (the primary researcher) will have access to this information.

Please feel free to contact me or my supervisor if you have any questions about this research project.

My supervisor is Dr Catherine Bacon phone 09 815 4321 ext. 8593 or email c.j.bacon@fltkw.co.nz

My phone number is 027 257 8044 and email address is, equineCAMresearch@gmail.com
2. Consent form

I have had the research project explained to me and I have read and understood the information sheet given to me.

I understand that I don't have to take part in this study if I don't want to.

I understand that everything I say is confidential and none of the personal information I give will be displayed in public documents.

The only people who may read the responses to my questionnaire items or may see this information linked to an individual will be the researcher and their academic supervisors. I also understand that all the information that I give will be stored securely on a computer for a period of 5 years.

I understand that I can see the finished research document.

I have had time to consider everything and I give my consent to be a part of this project.

Please consider this information and if you consent to participate in this study, continue with the survey. If you select 'yes' below and then complete the survey, this will be taken to mean that you have formally consented to taking part.

*1. Do you wish to continue with this survey?

☐ Yes
3. Section 1

General information

1. Age (years)

2. Gender

- Male
- Female

3. For HOW MANY horses are you the primary person responsible for their care?

*4. How would you best describe your involvement with horses (please select only one)

- Pony club member (go to question 5)
- Racehorse trainer (go to question 6)
- Sport horse competitor (go to question 7)

5. If you are a Pony Club member (please specify which club)

6. If you are a Racehorse trainer (please indicate how many horses for either harness or thoroughbred gallops)

- Small yard (less than 10 horses in training)
- Medium yard (11-25 horses in training)
- Large yard (greater than 26 horses in training)

- Harness racing
- Thoroughbred gallops

7. If you are a Sport Horse competitor, please complete the table below. In the table, indicate the number of horses for whom you are the primary carer and whose primary event is shown on the left-hand column. NOTE: If, one or more of your horses do more than one event please only include them in one category, the event that they do the most

<table>
<thead>
<tr>
<th>Event</th>
<th>No horses</th>
<th>1-2</th>
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<th>5-6</th>
<th>7-8</th>
<th>9-10</th>
<th>10+</th>
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<td>Show jumping &amp; show</td>
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<td>Endurance</td>
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4. Section 2

NOTE: Respondents who are NOT CAM users answer only Question 1 in this section.

The following questions in Section 2 are for people who HAVE used CAM in the last 12 months. (for example one of the CAM therapies listed below).

1. Have you used at least one non-veterinary therapy for your horse?
   - Yes (continue with this page)
   - No (Go to Section 3 by going to the bottom of the page and clicking NEXT)

2. In the last 12 months have you used any of these complementary or alternative medicine therapies for any of your horse(s)?
   (Please select the ones you have used. If none selected please go to SECTION 3)
   - Osteopathy
   - Physiotherapy
   - Chiropractic
   - Massage
   - Bowen therapy
   - Acupuncture
   - Acupressure
   - Homeopathy
   - Magnetic therapy
   - Ultra sound
   - Nutritional therapy (includes supplements & herbal remedies)
   - Aromatherapy
   - Thermotherapy
   - Hydrotherapy
   - Equine telepaths
   - Hyperbaric oxygen chamber
   - Electrical muscle stimulation
   - Laser therapy (Bioptron light therapy)
   - Photon therapy (Colour therapy)
   - Equine touch therapy

Other (please specify)

This question assesses the amount of times you’ve used CAM therapies and your beliefs and attitudes about the various CAM therapies you’ve used. You are asked to identify up to 4 CAM therapies you have used and, addressing one therapy at a time, please answer the following questions about it. NOTE: If you used more than 4 different therapies in the last year, please indicate the 4 that you used most frequently.
3. If you have used more than 4 different therapies in the last year, please indicate the 4 that you used most frequently. Fill out the questions for each therapy, questions for your second, third and fourth therapies follow.

Therapy 1 (name)

Name of practitioner (if known)

Qualification of practitioner (if known)

How many different Horses were treated with this therapy (in last year)

How many treatments with this therapy (total number)

did any of your horses receive in the last year? (does not apply to nutritional therapy)

Please explain the main reasons for seeking this treatment for your horse(s)

4. How beneficial do you think Therapy 1 was?

(please tick: -5= highly unbeneificial (i.e. the horse got a lot worse), 0= no effect, 5= highly beneficial (i.e. the horse got a lot better)

Therapy 1

-5 -4 -3 -2 -1 0 1 2 3 4 5

5. Were any of the horses treated using this therapy also under veterinary care for the same condition that they were being treated for?

○ Yes

○ No

6. Do/did you tell your vet that you use this CAM therapy on your horse(s)?

○ Always

○ Often

○ Sometimes

○ Rarely

○ Never
7. How important to you are each of the following sources of information about this particular CAM therapy in your decision to use them? (0= not important at all, 2= moderately important, 4= highly important)

- Word of mouth
- Own reading
- Vet recommended
- You personally know the practitioner
- They have previously approached and/or informed you of their therapy and training
- Other (please specify)

8. In your opinion, how important is each of the following attributes for this CAM practitioner? (0=not at all important, 2= moderately important, 4= very important)

- Good reputation
- Practical experience with animals
- Approved qualifications treating animals in their therapy
- Approved qualifications in their therapy
- They had a veterinary degree along with qualification in the other form of treatment
- Other (please specify)

These next set of questions are for the SECOND therapy you have selected from the list. If only one was selected please go to SECTION 3.

9. Please answer the following for the SECOND therapy you selected from the list:

- Name of practitioner (if known)
- Qualification of practitioner (if known)
- How many different horses were treated with this therapy (in last year)
- How many treatments with this therapy (total number)
- Did any of your horses receive this treatment in the last year?
- Please explain the main reasons for seeking this treatment for your horse(s)

10. How beneficial do you think Therapy 2 was? (please tick -5= highly unbeficial (i.e. the horse got a lot worse), 0= no effect, 5= highly beneficial (i.e. the horse got a lot better)

Therapy 2
11. Were any of the horses treated using this therapy also under veterinary care for the same condition that they were being treated for?

☐ Yes
☐ No

12. Do you tell your vet that you use this CAM therapy on your horse(s)?

☐ Always
☐ Often
☐ Sometimes
☐ Rarely
☐ Never

13. How important to you are each of the following sources of information about this particular CAM therapy in your decision to use them? (0= not important at all, 2= moderately important, 4= highly important)

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<thead>
<tr>
<th>Source of Information</th>
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<td>Word of mouth</td>
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<td>Own reading</td>
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<td>Vet recommended</td>
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<tr>
<td>You personally know the practitioner</td>
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<tr>
<td>They have previously approached you informing you of their therapy and training</td>
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<tr>
<td>Other (please specify)</td>
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</table>

14. In your opinion, how important is each of the following attributes for this CAM practitioner?

(0=not at all important, 2= moderately important, 4= very important)

<table>
<thead>
<tr>
<th>Attribute</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<tbody>
<tr>
<td>Good reputation</td>
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<tr>
<td>Practical experience with animals</td>
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<tr>
<td>Approved qualifications treating animals in their therapy</td>
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<td>Approved qualifications in their therapy</td>
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<tr>
<td>They had a veterinary degree along with qualification in the other form of treatment</td>
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<tr>
<td>Other (please specify)</td>
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</table>

These next set of questions are for the THRD therapy you have selected from the list. If only 2 were selected please go to SECTION 3 by going to the bottom of the page and click NEXT
15. Please answer the following for the THIRD therapy you selected from the list

<table>
<thead>
<tr>
<th>Therapy 3</th>
<th></th>
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<tbody>
<tr>
<td>Name of practitioner (if known)</td>
<td></td>
</tr>
<tr>
<td>Qualification of practitioner (if known)</td>
<td></td>
</tr>
<tr>
<td>How many different Horses were treated with this therapy (in last year)?</td>
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<tr>
<td>How many Treatments with this therapy (total number) did any of your horses receive in the last year?</td>
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<tr>
<td>Please explain the main reasons for seeking this treatment for your horse(s)</td>
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</table>

16. How beneficial do you think Therapy 3 was?

(please tick: -5 = highly unbenefficial (i.e. the horse got a lot worse), 0 = no effect, 5 = highly beneficial (i.e. the horse got a lot better))

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<th></th>
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<th>-4</th>
<th>-3</th>
<th>-2</th>
<th>-1</th>
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17. Were any of the horses treated using this therapy also under veterinary care for the same condition that they were being treated for?

- [ ] Yes
- [ ] No

18. Do you tell your vet that you use this CAM therapy on your horse(s)?

- [ ] Always
- [ ] Often
- [ ] Sometimes
- [ ] Rarely
- [ ] Never

19. How important to you are each of the following sources of information about this particular CAM therapy in your decision to use them? (0 = not important at all, 2 = moderately important, 4 = highly important)

<table>
<thead>
<tr>
<th>Information</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word of mouth</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Own reading</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Vet recommended</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>You personally know the practitioner</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>They have previously approached you informing you of their therapy and training</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (please specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
20. In your opinion, how important is each of the following attributes for this CAM practitioner?
(0=not at all important, 2=moderately important, 4=very important)

<table>
<thead>
<tr>
<th>Attribute</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good reputation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practical experience with animals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approved qualifications treating animals in their therapy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approved qualifications in their therapy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>They had a veterinary degree along with qualification in the other form of treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (please specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

These next set of questions are for the FOURTH therapy you have selected from the list. If only 3 were selected please go to SECTION 4 by going to the bottom of the page and click NEXT.

21. Please answer the following for the FOURTH therapy you selected from the list

<table>
<thead>
<tr>
<th>Therapy 4</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of practitioner (if known)</td>
<td></td>
</tr>
<tr>
<td>Qualification of practitioner (if known)</td>
<td></td>
</tr>
<tr>
<td>How many different Horses were treated with this therapy (in last year)</td>
<td></td>
</tr>
<tr>
<td>How many Treatments with this therapy (total number)</td>
<td></td>
</tr>
<tr>
<td>Did any of your horses receive in the last year?</td>
<td></td>
</tr>
<tr>
<td>Please explain the main reasons for seeking this treatment for your horse(s)</td>
<td></td>
</tr>
</tbody>
</table>

22. How beneficial do you think Therapy 4 was?
(please tick: -5=highly unbeneificial (i.e. the horse got a lot worse), 0=no effect, 5=highly beneficial (i.e. the horse got a lot better)

<table>
<thead>
<tr>
<th>Therapy 4</th>
<th>-5</th>
<th>-4</th>
<th>-3</th>
<th>-2</th>
<th>-1</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>

23. Were any of the horses treated using this therapy also under veterinary care for the same condition that they were being treated for?

- Yes
- No

24. Do you tell your vet that you use this CAM therapy on your horse(s)?

- Always
- Often
- Sometimes
- Rarely
- Never
25. How important to you are each of the following sources of information about this particular CAM therapy in your decision to use them? (0= not important at all, 2= moderately important, 4= highly important)

<table>
<thead>
<tr>
<th>Source</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word of mouth</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Own reading</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vet recommended</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>You personally know the practitioner</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>They have previously approached you informing you of their therapy and training</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (please specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

26. In your opinion, how important is each of the following attributes for this CAM practitioner? (0=not at all important, 2= moderately important, 4= very important)

<table>
<thead>
<tr>
<th>Attribute</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good reputation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practical experience with animals</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Approved qualifications treating animals in their therapy</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Approved qualifications in their therapy</td>
<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>They had a veterinary degree along with qualification in the other form of treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (please specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5. Section 3: ALL Respondents

The final questions assessed your attitudes towards different CAM therapy. Please complete these questions even if you have never used a CAM therapy on your horse before.

1. Please indicate how strongly you agree with the following statements about equine CAM focusing more on manual therapies (hands on) such as Osteopathy, Physio, Chiropractic, Bowen Therapy.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly disagree</th>
<th>Disagree somewhat</th>
<th>Neither agree nor disagree</th>
<th>Agree somewhat</th>
<th>Agree</th>
<th>Strongly agree</th>
<th>Unsure</th>
</tr>
</thead>
<tbody>
<tr>
<td>The horse(s) I care for have had conditions for which CAM was needed</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I believe that at least some CAM therapies are likely to be beneficial for horses</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I had heard that these therapies could be used on horses</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Vets have more knowledge than other equine therapy practitioners</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Vets are the best practitioners to decide what's best for a horse's health</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Equine CAM therapies are likely to be too expensive for my budget</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Equine CAM therapists are conveniently located for me</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

2. Please comment on any other reasons why you have chosen to or chosen not to use CAM for your horse(s)


3. If you felt your horse could benefit, what therapy/medicine would you use on the following common equine symptoms/medical problems? (Please tick all that apply) (vet= veterinary, chiro= chiropractor, osteo= osteopath, physio= physiotherapy)

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Vet</th>
<th>Acupuncture</th>
<th>Chiro</th>
<th>Homeopathy</th>
<th>Massage</th>
<th>Natural remedies</th>
<th>Osteo</th>
<th>Physio</th>
<th>Do nothing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head shaking</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Back soreness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neck pain</td>
<td></td>
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<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
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<tr>
<td>Lameness</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Temperament change</td>
<td></td>
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<td></td>
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<tr>
<td>Loss of performance</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Travelling problems</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rehabilitation-post operative</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loss of condition/wellbeing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chronic respiratory disorder</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Muscle injury</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tying-up</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rearing/ bucking</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Other (please specify) ________

4. Have you ever used any Complementary or alternative (CAM) therapies to treat yourself? (includes but not limited to; manual therapy, supplement use, mind-body therapy e.g. meditation)

- No

- Yes (please specify what THERAPIES)

- If YES (please specify the total number of TREATMENTS in last year)
Thank you for taking the time to complete this questionnaire.

1. To do into the draw to win a free ipod and in case we have any inquiries about what you have written and you do not mind us getting in contact with you, please leave your email address below

Please now click DONE. The next page you will see is advertising for the Survey Monkey website. Registering with Survey Monkey is completely optional and unconnected with this study so please disregard if you are not interested. Have a great day and thank you again.
Appendix C: Showjumping survey

Equine Complementary and Alternative Therapy Use

In the last 12 months have you used any of these complementary or alternative medicine therapies for any of your horse(s)?

- Osteopathy_______________________________
- Physiotherapy_____________________________
- Chiropractic_____________________________
- Massage_________________________________
- Bowen therapy____________________________
- Acupuncture_______________________________
- Acupressure_______________________________
- Homeopathy_______________________________
- Magnetic therapy___________________________
- Ultrasound_______________________________
- Aromatherapy_____________________________
- Thermotherapy____________________________
- Hydrotherapy_____________________________
- Equine telepaths__________________________
- Hyperbaric oxygen chamber__________________
- Electric muscle stimulation___________________
- Laser therapy (bioproton light therapy)________
- Photon therapy (colour therapy)_______________
- Equine Touch Therapy________________________
Appendix D: Instructions for authors for submission
to the New Zealand Veterinary Journal
New Zealand Veterinary Journal
Instructions for Authors
(updated 10 September 2011)

Please note the format of articles in the latest issue of the Journal and follow these instructions in the preparation of manuscripts.

Scope and general policy
The New Zealand Veterinary Journal publishes general scientific articles, rapid communications, clinical communications, short communications, reviews and correspondence on all aspects of veterinary science, animal welfare, and animal health aspects of animal science. The editorial policies of the Journal are in accordance with the Uniform Requirements for Manuscripts Submitted to Biomedical Journals published by the International Committee for Medical Journal Editors (ICMJE) at: www.icmje.org.

Publication options
The Journal is published by Taylor & Francis on behalf of the New Zealand Veterinary Association.

Accepted manuscripts are published online within 3 weeks of acceptance and subsequently allocated to issues published bimonthly in January, March, May, July, September and November each year.

Open access and rapid publication options are available on request. Median submission to acceptance time is less than 6 months.

Manuscript tracking and additional services for authors are available at: http://journalauthors.tandf.co.uk/.

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Submissions may be made electronically to the Editor, and must include:
- An electronic version of the manuscript, in PC format, of text and tables (preferably in MS Word), and figures (if possible; preferably in MS Excel or EPS format). Paper copies do not need to be submitted, but if felt necessary, only one full copy is required.
- A Manuscript Release Form signed by all authors that includes a declaration of conflict of interest, whether these do or do not exist, and the name of the animal or human ethics committee that approved the study, where applicable. If conflict of interest exists, details must be elaborated in the covering letter submitted with the manuscript.
- Manuscript Release Forms are available from the Editor or may be downloaded from the Journal’s website at: www.vetjournal.org.nz. The completed form may be posted or faxed, or a scanned image may be sent by email.
- A covering letter that includes (a) the category of article submitted; (b) the name and full contact details of the corresponding author who will be responsible for revisions and proof-reading; (c) details of any conflict of interest (see below); (d) the names and full contact details (including email addresses if available) of three possible referees; and; (e) information on any prior publication or submission of the article, in whole or in part, in electronic or printed form elsewhere. Please ensure the electronic copy of this covering letter contains the signature of the author for correspondence.
- An electronic copy of related manuscripts submitted or “in press” containing information material to the review or interpretation of the manuscript submitted to the Journal.

Notification of sources of funding and financial, conflicting or competing interests
Submissions must be accompanied by clear disclosures from all authors of their affiliations, funding and financial or competing interests that may have bearing on the submission.
- All authors must disclose in a separate statement to the Editor attached to the Manuscript Release Form all financial holdings, professional affiliations, advisory positions, board memberships, patent applications/holdings, or possible conflicts or competing interests that may bear relationship to the submitted work. The Editor will determine whether any of the material disclosed should be published as part of the article in a section preceding the Acknowledgements entitled, “Declaration of Interest”.
- All sources of funding and financial support pertaining to the submitted research, including support in kind, must be stated explicitly in the Acknowledgements section of the manuscript.
- Organisational affiliations of all authors including academic, corporate and other commercial affiliations that have any bearing on the study must be listed in the Acknowledgements section, or included in affiliations listed for each author as footnotes on the title page.

- Where funding or support has been provided from a commercial source or a conflict or competing interest exists, the role of the named parties in the experimental design, implementation, analysis, interpretation of results, reporting and decision to publish must be declared.
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All articles submitted for publication will be independently refereed regardless of source. Referees are selected by the Editorial Board, and may or may not include individuals nominated by authors. Referees will remain anonymous, unless both the referee and the Editor agree otherwise, and are obliged to keep all unpublished information confidential. Referees are asked to state explicitly whether or not any conflicts of interest that could bias their opinions of the manuscript exist, and to disqualify themselves from reviewing specific manuscripts if they believe it to be appropriate.

It is a policy of the Editorial Board of the New Zealand Veterinary Journal that revised manuscripts should reach the editorial office within 3 months of review, or they will be considered to have lapsed, requiring resubmission and re-review.

The final decision concerning acceptability of a manuscript is the responsibility of the Editor. Failure to comply with Journal policy at any stage is grounds for rejection.

Preparation of manuscripts
Authors are urged to consult a recent issue of the Journal and follow the style therein as closely as possible. Manuscripts must be written in English of a high standard and are expected to have been peer-reviewed for scientific content and correctness of language and presentation prior to submission. Manuscripts that conform poorly with editorial requirements and the format of the Journal may be returned without review.

For submissions where the quality of English is assessed as sub-standard, i.e. requiring additional editorial input, authors will be given the option of enlisting the assistance of a professional editor proficient in English, or the Journal may offer this service for a fee.

Classes of articles
Review Articles provide expert summaries of current knowledge in a particular field, and have no set format. Authors should consult the Editor before embarking on a review. Submissions of review articles longer than 10,000 words, including references, will not be accepted without prior consultation and approval from the Editor.

General Scientific Articles report new and substantial contributions to veterinary science based on original research. They have the format: Abstract, Introduction, Materials and Methods, Results, Discussion, Acknowledgements and References.

Clinical Communications report novel observations from clinical practice. The format may include Abstract, Introduction, Case History, Clinical Findings, Discussion, Acknowledgements and References.

Short Communications are vehicles for valuable but limited or preliminary observations. They generally have the same format as General Scientific Articles.

Rapid Communications may be preliminary in nature, and re-
port information of pressing importance. At the discretion of the Editorial Board, these will be published as soon as possible following peer review and should follow the format of General Scientific Articles.

Correspondence contains no headings, but may be followed by a short list of references. Correspondence of a scientific nature should follow the usual sequence for scientific articles, and normally contain no more than one table or illustration.

Journal style and layout

Manuscripts should be printed double-spaced throughout, on one side only of A4 paper, with at least 2-cm margins on all sides. Number all pages consecutively, and every fifth line in the left margin of each page, continuously.

Headings and sub-headings should be typed on separate lines and are not followed by stops. Headings (e.g. "Materials and methods") should be centred and bold. Only the first letter of headings and sub-headings is capitalised. Primary sub-headings (e.g. "Experimental design") should be left-justified and bold; secondary sub-headings are left-justified and italicised. Do not use underlining and do not number sub-headings or itemised lists.

Style and spelling follow the New Zealand Style Book (available from GP Publications, Wellington, NZ) and the Concise Oxford Dictionary, except that the verbal suffix "-ise" is used, not "-ize".

Numbers are generally printed as numerals unless at the beginning of a sentence, or when clarity requires. A decimal point must always be preceded by a numeral, e.g. "0.5", not ".5"; do not use a comma, i.e. not "0,5".

Quantities. All measurements should be reported in SI units or their decimal multiples, unless it is normal practice in a discipline to use derivative, e.g. the international unit and the curie. The New Zealand Standard 6501 (available from Standards New Zealand at: www.standards.co.nz), contains the recommended units of measure.

Dates take the form "25 August 2000" in the text, but they may be abbreviated in tables and figures. Use the 24-hour clock for times of day.

Abbreviations. The following abbreviations may be without definition in the Journal. In addition, all chemical elements, common chemical formulae, SI and units of measure used with a value should be used without definition. Abbreviations are generally not permitted in the Title. Plural abbreviations do not require "s".

cDNA Complementary deoxyribonucleic acid
cfu Colony forming units
cRNA Complementary ribonucleic acid
dNA Deoxyribonucleic acid
DNase Deoxyribonuclease
EDTA Ethylene diamino tetra-acetate
ELISA Enzyme-linked immunosorbent assay
epg Eggs per gram of faeces
H&E Haematoxylin and eosin
Ig Immunoglobulin
I/M Intramuscular(lv)
I/V Intravenous(lv)
kb Kilobyte(s)
LDso Dose killing 50% of exposed population
mRNA Messenger ribonucleic acid
PCR Polymerase chain reaction
PFGE Pulsed-field gel electrophoresis
RIA Radioimmunoassay
RNA Ribonucleic acid
RNase Ribonuclease
rpm Revolutions per minute
rRNA Ribosomal ribonucleic acid
S/C Subcutaneous(lv)
Tris Tris(hydroxymethyl)aminomethane

The use of other abbreviations should be limited as much as possible. They should not be used if they are in any way ambiguous. Non-standard abbreviations should be listed after the Abstract, and their meaning must be clearly evident or explained when they are first introduced. For international units, "IU" should be used; "U" should be used for enzyme activity. Units of length, weight and volume should be given in lower case (e.g. kg, mg/L). Abbreviations for chemical elements, SI units, contractions and suspensions in common use (including country names such as USA, UK and NZ, but excluding "e.g." and "i.e.") are not followed by stops; other suspensions generally are (e.g. pers. comm.). The abbreviations "e.g." and "i.e." are not italicised but "et al.", "ad libitum" "in vivo", "in vitro" are. Probability values are given in the form "p=0.003" (lower case, no spaces, to 2 or 3 decimal places only) (see Statistical Guidelines below).

Nomenclature. Manuscripts should conform to internationally recognised codes of nomenclature (e.g. the International Code of Zoological Nomenclature, International Code of Nomenclature of Bacteria, and the International Code of Botanical Nomenclature). All biota should be identified by their scientific names when the English term is first used, with the exception of common domestic animals. Generic and specific names should be italicised. Names of organisms should be given in full when used in the Title and when first used in the Abstract or text; after first use, generic names should be abbreviated as far as possible without causing confusion.

Footnotes (other than for authors’ addresses on the title page) should be used to (a) indicate the address of people cited as personal communications; and (b) to elaborate abbreviations and headings in tables.

Format

Titles should be short, specific and informative. Only the first letter is capitalised. Do not use trade names or abbreviations in the title. Authors’ names and addresses. Use initials (without stops) and
surnames only, separated by commas. The superscript symbols (* † ‡ # ¥, in that order) should be used after each author’s name to identify their full postal address and the author for correspondence (§) in footnotes at the bottom of the first page. The same symbol should be used for authors from the same address, e.g. AB Smith, CD Jones and EF Harris. Abstracts should contain the following internal subheadings for scientific articles and short communications: Aims, Methods, Results, Conclusions, Clinical Relevance, and Key Words; for technical communications use: Case History, Clinical Findings, Diagnosis, Clinical Relevance, and Key Words. Abstracts should be no more than 400 words in length, brief and informative when read in isolation from the article, include the main results and conclusions of the study, and should not contain abbreviations unless these are defined in the Abstract itself. All non-standard abbreviations should be listed after the Abstract.

Introduction. This should set the study in context by briefly reviewing relevant knowledge, and must contain a clear and concise statement of the study’s aims.

Materials and Methods should contain sufficient detail to allow others to repeat the study. For studies that involve the experimental use of humans or animals, the name of the human or animal ethics committee that approved the study must be given in the text. The generic name, dose and route of administration should be given for drugs, and the manufacturer’s name and location (city, state, and country) of drugs, reagents and specialised equipment used should be stated in parentheses on first reference. Thereafter, only generic names should be used. Details of all statistical methods used must be given at the end of this section under the subheading “Statistical analysis”, and should include adequate detail to allow readers to determine precisely how data have been analysed and presented.

Results should be presented concisely and logically without discussion or reference to other work. Data presented in tables and figures should not be repeated in text. Actual probability values should be given, to 2 or 3 decimal places, wherever possible (e.g. “p<0.01” rather than “p=0.05”) except where p<0.001.

Discussion should evaluate and interpret the results and relate these to the results and interpretations of other relevant studies. Do not repeat or present new results in this section. Care should be taken to develop the Discussion in a logical and concise manner, and it should end with a statement of conclusions and brief summary of the clinical relevance of your findings, wherever applicable.

Acknowledgements should be brief, and only include people who have made a direct contribution or provided material or financial support. All sources of funding for the submitted research must be stated.

References. The accuracy of references is the responsibility of authors, and references must be verified against the original article. Please ensure that all articles cited in the text are included in the References list and vice versa. In the text, citations should be listed in parentheses in chronological order, citing authors’ names, and using “et al.” after the first author’s name where there are more than two, e.g. (Jones 1994; Smith and Jones 1996; Smith et al. 2000). In the References list, references must be in alphabetical order of the first author and include the names of all authors. When no author is given, use the term “Anonymous” in both text and Refer-
ated, and you should be personally satisfied that the data are defensible. Please provide the full title of the work, its full URL so that the exact information being referred to can be accessed, last date of accession, and the name of the organism publishing the website. The authors' names should be provided wherever possible, else listed as Anonymous, e.g.


Avoid using abstracts as references, and do not use "unpublished data" or "personal communications" unless they exist in written form. If they do, they may be referred to in the text, but must not appear in the References list. A pers. comm. should be a numbered footnote including the author's initials and last name, followed by workplace name, city and country.

References to papers which have been accepted but not published should be cited as "in press", whereas papers which have been submitted but not accepted should be referred to as "unpublished data".

Tables
Tabular material should be kept to a minimum and printed on separate pages after the References. Information in tables must not be repeated in the text. Tables must be numbered consecutively (Arabic numbers) in the order they are referred to, and be understandable without reference to the text. The title should be a single sentence typed at the head of the table; additional explanatory information including non-standard abbreviations should appear as alphabetically ordered footnotes across-referenced to the column entries. If using superscript letters to denote significant differences between means, use $^*$ and elaborate these in footnotes.

Tables should be constructed using the Table function of a word processor or spreadsheet (MS Word or Excel preferred), with each entry in a separate cell; avoid using tabs or line breaks within cells. Do not use vertical lines. Use horizontal lines to separate the table from the title and footnotes, and column headings from data. Only the first letter of column or row headings should be capitalised. Unit descriptors should be placed under each column heading in parentheses and chosen to minimise the number of digits in each column. Report zero values as "0", and any values not tested as "NT", and identify the statistical measure(s) of variation used in either the title or footnotes.

Figures
Figures should be submitted in the highest quality format possible. Failure to comply with the following instructions will result in figures being returned to authors and publication being delayed.

Figures should be placed at the end of the manuscript on separate pages and numbered consecutively using Arabic numerals in the order they are described in the text (e.g. "Figure 1"). Figure captions should be listed on a separate page containing an explanation of all markers, lines and symbols used (i.e. the key), as well as all abbreviations. Each caption should contain sufficient information that it stands alone from the text. Authors should consult a recent issue of the Journal for examples of the presentation of Figures.

Figure size. Figures should constructed exactly as the authors want them reproduced, at the final size for publication, e.g. single column width (88 mm).

Font size and line thickness as described below apply to the Figure at final publication size. Do not include a box around, or gridlines within the Figure.

Font size. The font for all text within the figure and axis labels should be sans-serif type (e.g. Arial) 7 point.

Line thickness. The thickness of all lines including axes, tick marks, whiskers, and connecting lines between datapoints should be 0.2 mm (0.57 point)

Axis labels. Tick marks should face outwards, and titles for axes should run parallel to their axes, left to right and bottom to top, using capital letters for the first word only. State the value being measured, followed by its appropriate SI unit in parentheses, e.g. "Liveweight (kg)"

Symbols and shading. For line graphs the preferred symbols are ???. If more symbols are required, ensure their shape is different enough that they are still distinct enough when overlapping occurs. Lines should not be visible within symbols or bars. For bar graphs use white, then black, then grey shading as either 10%, 30% or 50%. Avoid the use of three-dimensional bar charts.

Photomicrographs, X-rays, photographs. Bar scales should be used on photographs and diagrams; magnifications should only be stated for electron photomicrographs. The thickness of lines for bars (depicting scale) or for arrows should be 0.53 mm (1.5 point) at the final size the figure will be reproduced (eg single column width, as above). Any lettering or numbers within a photomicrograph, X-ray or photograph should be sans-serif type (e.g. Arial) 10 point. If figures require cropping or reorienting, this must be done prior to submission.

File formats. Figures should be saved as high-resolution files, either EPS or TIFF, with a minimum resolution of 300–600 dpi. Most graphic applications allow files to be saved as EPS files. However, a PostScript printer driver may need to be installed to do this. The file can be then be saved using the 'print to file' option. PDF files may be acceptable, but only if generated from a digital source, i.e. graphic software, NOT an image or scanned image. See also: http://journalauthors.tandf.co.uk/preparation/artwork.asp. Files from MS Excel or MS PowerPoint are not acceptable.

Each figure, including each part of a figure, e.g. Figure 1a, Figure 1b, should be saved as a separate file, but do not add the labels (a, b, etc) to the figure. Each figure should preferably not exceed 10 MB per individual file.

Authors are required to pay the cost of reproducing colour drawings and photographs. Please indicate on submission if you require colour reproduction.

Supplementary Information
Supplementary information (SI) is peer-reviewed material directly relevant to the conclusion of a paper that cannot be included in the printed version for reasons of space. SI is posted online with the article at the time of publication, generally as a separate PDF. It must be related to and add to the content of the article. Categories of SI may include: supplementary figure(s) and legend(s); supplementary methods; supplementary table(s); supplementary equation(s); supplementary data.

Supplementary information should be submitted at the same time as the manuscript and will be subject to peer-review and editorial scrutiny. SI is not copy-edited so authors should en-
When several analytical methods are used, clearly state where each method was applied. Two-sided tests are to be used unless a strong argument is presented to justify a one-sided test. Complex procedures should be explained in detail or referenced. Software packages used should be identified by name, version and supplier, e.g. SPSS v9.0 for Windows (SPSS Inc, Chicago IL, USA). Assumptions. Many statistical methods have implicit assumptions (distribution of data, independence of observations, etc). Data should be tested to ensure these assumptions are met. If transformation of data is used to meet the assumptions of a statistical method it should be verified that the required effect has been achieved. Lack of independence. If measurements are not independent (e.g. repeated measures, animals clustered in pens or flocks), appropriate measures should be taken to account for clustering. Possible correlation between outcome measurements, and co-linearity between explanatory variables in observational studies should be evaluated. Extreme datapoints. Observations that are inconsistent with the overall data (‘outliers’) should not be excluded without clear justification, and any omissions should be documented.

Presentation
All items referred to in Materials and Methods should be presented in Results and vice versa.

Descriptive statistics. Measures of central tendency (e.g. mean, median) must be accompanied by measures of variation among individuals (e.g. SD, inter-quartile range) or precision for population estimates (e.g. SEM). For ordered qualitative data that do not approximate to a continuous linear measure, the use of means and SE or SD is invalid, and proportions should be stated. CI must be presented for population parameters, and estimates of effect such as OR and RR. For comparative studies, CI for observed differences should be reported rather than separate CI for each comparison group.

Format. Use the following format: e.g. mean 14.2 (SD 7.4) or mean 14.2 (SEM 1.9) rather than 14.2 ± 7.4. Report CI in the same manner, i.e. mean 14.2 (95% CI=10.2–18.3); OR=0.74 (95% CI=0.57–0.96).

Numerical precision. Numerical results should be presented with appropriate precision. Means should not be presented to more than one decimal place more than the raw data. Percentages should not be presented with decimal places unless n>100, and should always indicate the denominator.

Hypothesis tests. Exact p-values should be reported to two or three decimal places when between 0.01 and 0.05, and to three decimal places when between 0.010 and 0.001. P-values <0.001 should be reported as such. Avoid over-emphasis on p-values to dichotomise significant results. Interpretation of hypothesis tests should consider study power, type-1 error rate (e.g. 0.05), sample size, the size of the effect with CI and biological significance. Biologically meaningful effects may not be statistically significant if sample size is small. Estimation of the size of the effect (with CI) can be helpful in interpretation of test results, particularly if the reported p-value exceeds the defined threshold. Multiple comparisons require the use of an appropriate adjustment to control type-1 error.

Post-hoc power analysis may be helpful in some studies. P-values from post-hoc analyses or modelling of multiple explanatory variables, e.g. in epidemiological studies of risk factors, should be considered as exploratory and not equivalent to tests of pre-specified hypotheses.