

PERSPECTIVES IN

Animal Health and Welfare

VOLUME 2 / ISSUE 1 / 2023

Published ahead of issue
Received: 21 August 2023
Accepted: 25 September 2023
Published: November 2023

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<https://doi.org/10.34074/piahw.002103>

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This publication may be cited as:

Brown, F. (2023). Optimising staff utilisation in rural animal veterinary practice in Aotearoa / New Zealand. *Perspectives in Animal Health and Welfare*, 2(1), 21–43. <https://doi.org/10.34074/piahw.002103>

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ISSN 2816-0290

Optimising staff utilisation in rural animal veterinary practice in Aotearoa / New Zealand

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Abstract

Utilisation of veterinary professional staff in rural animal veterinary practice has long been anecdotally reported as poor in Aotearoa / New Zealand. Evidence shows that skill utilisation is poor, and this is likely impacted by the low ratios of non-veterinarian staff to each veterinarian in rural animal veterinary practice. This participative action research utilised focus groups with a range of staff practising in rural animal veterinary practice in Aotearoa / New Zealand, who self-selected as having experience with excellent utilisation. Participants were asked to imagine what a future with excellent utilisation in rural animal veterinary practice in Aotearoa / New Zealand would look like. This research clarifies role definitions of a veterinarian, rural animal veterinary technician and rural animal healthcare assistant, and documents examples of task allocation in an interprofessional team. The participants identified that the outcomes of achieving appropriate utilisation are likely to be beneficial to individuals, the team, animals, clients, and the business profitability, however, a significant number of barriers were identified that may prevent implementation of appropriate utilisation. These included a disconnect between the current rural animal veterinary technician qualifications and the requirement from veterinary clinical practice for specific skills, rather than a full qualification; the current veterinary training pathway not setting up veterinarians to be consultants; lack of regulation of allied veterinary professionals; current skills in the team; lack of trust in technicians from veterinarians; perception of client expectations that a vet will attend; willingness of veterinarians to relinquish control; lack of availability of technical staff; the requirement for veterinarians to provide 27/4 after-hours service; and the risk of technicians leaving after being trained up to go out on their own. Whilst overcoming some of these barriers requires industry-led solutions, many can be resolved immediately within individual teams. Therefore, there is no need to wait for industry change to begin creating veterinary teams with excellent utilisation within individual rural animal veterinary practices.

Keywords

Veterinary staff utilisation, wellbeing, rural animal veterinary practice, veterinary technician, animal healthcare assistant, business, animal welfare

Introduction

In recent decades, there have been significant changes in farming compliance requirements, and this has meant the requirements of farmers to meet their animal healthcare needs has changed (Keenan, 2019). In addition, there is increasing difficulty attracting and retaining veterinarians to the rural sector (Weston & King 2019; Adam et al., 2015; Guildford 2008), which led to the development of the rural vet bonding scheme that started in 2009 and continues today (Ministry for Primary Industries, n.d.). Both factors have contributed to a vastly changed landscape for rural animal veterinary practice in Aotearoa / New Zealand. It has also been recognised that a skilled interprofessional team is able to deliver the needs of a significant proportion of services that were previously the domain of veterinarians (Reader, 2012). In Aotearoa / New Zealand these teams involve veterinarians (vets), technicians who may hold formal qualifications and/or are trained in specific limited skill-sets, customer service and administrative staff, and managers.

Rural animal veterinary practice in Aotearoa / New Zealand has only relatively recently begun to embrace the use of technicians to support their work and consequently the numbers have grown, and the scope of practice has expanded. In 2005, Matthews could only locate ten technicians in Aotearoa/ New Zealand, but by 2022 these numbers had grown significantly. While exact numbers are not known, at a recent large-animal technicians conference in Aotearoa / New Zealand (New Zealand Veterinary Association Events, 2022) there were over 100 delegates, and this was likely to have been representative of only a small proportion of technicians employed in rural animal veterinary practice in this country and therefore provides an insight into

the growth. There is no available published data about what the current ratios are in Aotearoa / New Zealand of technicians to large animal veterinarians, nor any data worldwide that would appear to be comparative.

An extensive body of literature has consistently highlighted the correlation between poor utilisation of staff skill-sets and diminished workplace wellbeing (Brown, 2020; Page & Vella-Brodrick, 2009; Grawitch et al., 2006). Nelissen et al. (2017) asserted that effective utilisation stands as a powerful predictor of job satisfaction, thereby potentially influencing the inclination of employees to remain committed to an organisation. Beyond its impact on staff wellbeing, there are notable financial advantages associated with mitigating staff turnover. Davidson et al. (2010) and De Winne et al. (2019) have provided empirical evidence on the detrimental financial repercussions of high employee turnover in various industries, which can be extrapolated to the veterinary sector. Furthermore, employing staff members in unsuitable roles can lead to financial inefficiencies. For instance, employing a veterinarian on a higher salary to perform tasks that could be handled by a rural animal veterinary technician exemplifies such misalignment. Consequently, this can jeopardise the financial sustainability of a business, potentially leading to reduced staff salaries and/or increased client fees.

Despite the literature being supportive of the benefits of better staff utilisation, there is limited research describing appropriate ratios of non-veterinarian staff to vets, and these appear to only apply to companion animal veterinary practice. Shock et al. (2020) undertook a study in Canada that found that for each additional registered veterinary technician per veterinarian, there was an increase in gross annual profit per veterinarian. Ouedraogo et al. (2022) undertook a revenue and productivity analysis of veterinary practices and concluded that, in terms of revenue gain, the appropriate ratio of non-veterinarian staff to veterinarians was 9:1 for revenue gain and 8:1 for productivity gain in companion animal practice, but no similar study could be located for rural animal veterinary practice.

Furthermore, multiple barriers preventing the improvement of staff utilisation in Aotearoa / New Zealand were identified by Brown (2022; Brown & Ma, 2023). These barriers included: trust in the allied veterinary professionals (AVPs), poor team culture, perceived or real skill deficits of the AVPs, insufficient time available for training, current legislation restrictions, and lack of regulation for AVPs. Clear role expectations and responsibilities are also essential for implementing

excellent utilisation to help avoid conflict between roles when balancing the workload, as discussed by Young (2021) when looking at utilisation of veterinary nursing assistants in Aotearoa / New Zealand. Although this is a companion animal context, it could be extrapolated to rural animal practice.

Currently, there appears to be a lack of clarity as to how rural animal veterinary practices can change their structures to improve utilisation. No guidelines of excellent utilisation appear to exist in published literature for rural animal veterinary practices to consider and adapt for their own business contexts. Providing such guidelines would allow businesses to shift from awareness of poor utilisation to actioning change.

This research aimed to examine what appropriate utilisation in rural animal veterinary practices in Aotearoa / New Zealand looks like and what the barriers are to implementing that. It utilised participatory action research methodology, incorporating the end user; consulting employers, employees and educators with experience in excellent utilisation, working in the veterinary sector, to:

- clarify the role definitions for veterinarians (vets), rural animal veterinary technicians (RAVTs), and rural animal healthcare assistants (RAHCAs).
- clarify the tasks that fit with each role.
- identify the benefits of excellent staff utilisation for the business.
- understand the perceived barriers the Aotearoa / New Zealand rural animal veterinary sector faces in implementing a model of excellent utilisation.

Methodology

This research used participatory action research methodology, utilising focus groups, which enabled collaboration with end users to be included in the process to design for improved staff utilisation. End users included employers, employees, and educators from the veterinary sector, who were vets or RAVTs. The focus groups were preceded by participants completing a pre-focus-group survey to provide a baseline to start conversations in the focus groups. The survey findings were discussed in the focus groups, along with resolutions for any challenges that were identified. Ultimately, this allowed the focus groups to discuss solutions to improve staff utilisation in rural animal veterinary practice.

The use of participatory action research methodology

can foster positive change through shifting from the concept that experts know everything, to enabling end users to be part of the research and design (Chevalier & Buckles, 2019). This has the potential to increase the acceptability and accessibility of research outcomes and facilitate change.

Participants were sought throughout the Aotearoa / New Zealand veterinary sector networks. This included the New Zealand Veterinary Association; Veterinary Council of New Zealand; New Zealand Veterinary Nursing Association; and through tertiary education providers who offer veterinary science or veterinary nursing training in Aotearoa / New Zealand, and their alumni. Members of these networks were asked to express interest if they had prior experience in a rural animal veterinary practice with what they determined

as excellent utilisation of staff. The aim was to recruit six to eight participants per focus group. The sample size was met for the pre-focus-group survey for the employee focus group, with a slightly smaller number for the educator and employer groups. The size of the synchronous focus groups was then, in some cases, further reduced due to scheduling difficulties. This is shown in Table 1. Table 2 shows the demographic range of the participants in each synchronous focus group.

This research was approved by Otago Polytechnic Research Ethics Committee (approval number 944) and confidentiality of participants was strictly maintained. Confidentiality was important to ensure that meaningful conversations about changing industry norms were able to be held in a safe environment.

Table 1. Numbers of participants at each stage of the research.

	Pre-focus-group survey	Focus-group participants	Post-focus-group feedback
Educator	4	3	2
Employee	6	5	2
Employer	4	4	1
TOTAL	14	12	5

Table 2. Demographic information for the focus-group participants.

Focus-group participants	Gender	Cultural identity	Age range	Qualifications	Experience
Educator	2 male, 1 female	All overseas European	All >40	Equine studies, equine veterinary nursing, animal science	All experienced in their industry and all now hold senior teaching positions in the tertiary education sector in New Zealand
Employee	2 male, 3 female	NZ European	30–65+	3 technicians, 2 vets, 1 equine veterinary nurse	All currently practising in practices with good AVP utilisation
Employer	3 male, 1 female	NZ European	40–65+	3 veterinarians, 1 veterinary nurse	All vets have long-standing positions in South Island rural practice, one practice manager with 2+ decades experience

Stage 1: Pre-focus-group survey

Prior to the focus groups, participants were asked to complete a survey administered via Microsoft forms. The survey asked participants to imagine a rural animal veterinary practice where all staff are utilised appropriately under current Aotearoa / New Zealand law. They were asked to assign 153 tasks to a vet, a RAVT, an AHCA, or “other” role. The results were analysed prior to the focus group, examining response stratified by focus group and by role in the veterinary sector of the participant, to determine what the existing understanding of the roles and responsibilities was. This provided the initial starting point for the focus-group discussions.

Stage 2: Focus group

The use of focus groups enabled collaboration with end users to present a solution to a key veterinary practice challenge of improving staff utilisation. Following the completion of the pre-focus-group survey, each focus group was held online using Microsoft Teams, at a time that suited the majority of the participants. Three focus groups were formed according to industry roles: employers, employees and educators. Focus groups were recorded and notes were taken by two researchers. A semi-structured approach was used to facilitate the flow of conversation.

The pre-focus-group survey results were discussed and definitions for each role were created. Consideration was also given to existing legal limitations as defined by the Veterinarians Act 2005 and Section 15 of the Animal Welfare Act 1999 relating to restrictions on procedures. Once clarity was established with each role, the focus group discussed how a rural animal veterinary practice would operate when staff were utilised appropriately in alignment with these role definitions. The focus groups then identified what outcomes would result from this excellent-utilisation scenario, the barriers to implementing such a model, and potential ways to mitigate these barriers.

Stage 3: Post-focus-group analysis

The notes taken by the researcher and note takers during the focus group, and a subsequent review of the recordings by the researchers enabled themes and concepts to be collated. These themes and concepts from each of the three focus groups were then examined for commonalities and differences between each of the focus groups. Using the themes and common concepts from the focus-group discussions the researchers:

- created definitions for each role: vet, RAVT, RAHCA and other.
- tasks were discussed and grouped following the formation of definitions but also based on practicalities of how technical staff are used in real-life practice.
- summarised:
 - the outcomes of implementing this utilisation model.
 - the perceived barriers to implementing this model.

Stage 4: Post-focus-group feedback

The outcomes above were then presented to the focus-group participants individually, in the form of a PowerPoint presentation provided as a PDF via email. This enabled the participants to individually review the findings and conclusions drawn and provide feedback, which is an important part of a co-design process. Each participant was asked whether they agreed with each aspect of the summary, and to provide commentary where they disagreed. They were also asked to comment on the mitigations proposed by the researchers to the barriers they had identified in the focus groups. Participant feedback was collected through a Microsoft form, which asked specific questions about each page in the presentation. A comparative review of the post-focus-group feedback was conducted, and the summary of outcomes amended based on the feedback themes.

Results

Participant information

As shown in Table 1, 14 participants completed the pre-focus-group survey. Due to scheduling difficulty, only 12 of the 14 survey participants attended the focus groups. Finally, five of the focus-group participants reviewed the post-focus-group analysis summary and returned their feedback.

Table 2 shows the demographic of the participants. All educators identified as overseas European, and all the employer and employee participants identified as New Zealand European. Five participants were female and seven were male. The age range in the employer group was 40–65+ years of age, whereas the employee group covered a wider range of ages, from 30–65+, covering from early/mid-career through to end of career. The participants of this focus group were all over 40. The

educator group contained no veterinarians, the employee group was a mix of technicians and veterinarians, and the employer groups was 75% veterinarians and one practice manager who had previously trained as a veterinary nurse.

Role definitions and task allocations

The pre-focus-group survey identified a significant challenge. Regardless of the focus group, most tasks were assigned across the range of roles provided by the participants. These included vets being assigned tasks that do not require specific veterinary training, and technicians being assigned tasks that are illegal for them to carry out, as they are legally defined as significant surgical procedures (New Zealand Government, 2020). These conflicting findings were used to open the focus-group discussions, with an initial focus on clarifying the role definitions.

After post-focus-group feedback was received by researchers, minor refinements were made, and the following role definitions were agreed upon by the participants:

Rural animal veterinarian:

- Diagnoses
- Prescribes
- Authorises
- Performs surgery
- Maintains overall responsibility but only carries out veterinary-only tasks, the remainder are delegated to technical staff

Large animal technician/rural animal veterinary technician (RAVT):

- Enacts veterinary diagnostic and management plan.
- Undertakes non-veterinarian-only tasks that require clinical assessment and decision making (more skilled tasks).
- May be the primary client liaison.
- Carries out role under broad supervision of veterinarian.
- Leads unregistered technical staff.

Other technical support, also known as a rural animal healthcare assistant (RAHCA):

- Husbandry, including patient restraint.
- Cleaning/hygiene tasks throughout the practice.
- Some administering of medication tasks, but not in a

client-facing context.

- Under direction of veterinarian or registered veterinary technician.

Other roles not requiring formal animal-specific training:

- Stock ordering/management across the practice.
- Front-of-house customer relations (no advice, first contact, identifies needs and follows through with the right person).

What was clear from the focus groups is that except where the task is veterinarian-only by law, tasks should be carried out by the person with the right skill set, rather than a specific role title (linked to a qualification). How the skill set was gained was variable; some skills were considered entry level – i.e., casual staff could do – while others were believed to require more training.

Rather than assign the tasks to role titles (linked to a qualification), Tables 3, 4, 5 and 6 identify which of the tasks from the survey are veterinarian-only, and then broadly group the other tasks from entry level to the more skilled roles. The groups of tasks have been formed based on the pre-focus-group survey responses, the discussions in the focus groups and individual post-focus-group feedback.

The tasks in Tables 3, 4, 5 and 6 are not an exclusive list of all tasks in a rural animal veterinary practice, and omit many of the customer-service and client-relations aspects.

Table 3. Veterinarian roles/tasks.

Anaesthesia and analgesia	
<ul style="list-style-type: none"> Assess patient risk (ASA scale) Pre-anaesthetic examination 	<ul style="list-style-type: none"> Administration of local anaesthetic nerve block for lameness examinations
Clinical examination	
<ul style="list-style-type: none"> Collective objective information (physical exam) 	<ul style="list-style-type: none"> Analysis and plan
Diagnostics	
<ul style="list-style-type: none"> Assessing diagnostic quality of radiographs Endoscopy Liver biopsy Joint flush 	<ul style="list-style-type: none"> Post mortem (other than neonatal lambs) Taking radiographs (including patient positioning) Ultrasound exam for other diagnostics (e.g., abdominal)
Emergency	
<ul style="list-style-type: none"> Making decisions regarding emergency drug administration 	
Management plans	
<ul style="list-style-type: none"> Developing and managing disease-specific care plans (involving physical, behavioural, diagnostic and pharmacological interventions) Euthanasia and grief counselling – farm (e.g., whole herd) 	<ul style="list-style-type: none"> Non-routine discharge (e.g., surgical complications, large wounds) VOI – Analysis and plan (decision making) Whole-herd annual animal health plan
Pharmacology	
<ul style="list-style-type: none"> Prescribing medications 	
Research	
<ul style="list-style-type: none"> Managing field research 	
Surgery	
<ul style="list-style-type: none"> Skin suturing of a simple wound/laceration under local Skin suturing to close a surgery 	<ul style="list-style-type: none"> Surgical castration Internal soft-tissue surgery

Table 4. Non-veterinarian but more highly skilled tasks.

Administrative functions	
<ul style="list-style-type: none"> • Development and auditing of standard operating procedures (SOPs) • Discussing finance options • Follow-up calls (non-surgical) • Giving routine quotes to clients • Giving individualised, non-routine quotes to clients 	<ul style="list-style-type: none"> • Maintaining and recording medical notes • On-farm consent forms e.g., for xylazine administration at disbudding • Reporting lab results • Post-operative follow-up calls • Telephone triaging
Anaesthesia and analgesia	
<ul style="list-style-type: none"> • Administration of sedative/local/induction agent • Administration of local anaesthetic nerve block – other than lameness examinations 	<ul style="list-style-type: none"> • Local anaesthetic blocks (e.g., dental and orthopaedic nerve blocks) • Monitoring and maintenance of anaesthesia • Pain scoring and assessment
Clinical examination	
<ul style="list-style-type: none"> • Body condition scoring: dairy cattle, sheep, deer, other rural species • Clinical examination subjective (history taking) • Dairy cattle tail scoring 	<ul style="list-style-type: none"> • Locomotion scoring – cattle • Locomotion scoring – sheep • Wound assessment, ongoing monitoring, and reporting on wound status
Diagnostics	
<ul style="list-style-type: none"> • Blood smear preparation • Collecting samples for DNA testing • Microscopy interpretation – urine, skin, ear, blood smear, FNA, etc. • Fluorescein stain eye examination • Faecal egg counts • Pasture tests, e.g., nitrate, facial eczema spore counts 	<ul style="list-style-type: none"> • Post mortem (lamb) • Pregnancy ultrasound scanning (trans-abdominal) • Pregnancy ultrasound scanning (per rectum) • Sterile milk sample collection • Skin scrape and slide preparation • Taking a fine needle aspirate sample (skin mass) • Taking a fine needle aspirate sample (deeper than skin) • Venepuncture (blood sampling)

Emergency	
<ul style="list-style-type: none"> • Initiating CPR (e.g., paediatrics) • Directing CPR (e.g., paediatrics) 	<ul style="list-style-type: none"> • Emergency IV catheter placement • Monitoring emergency/unstable patient
Husbandry	
<ul style="list-style-type: none"> • Disease-specific healthcare education and counselling • Farm dog wellness programmes 	<ul style="list-style-type: none"> • Infectious and/or zoonotic patient husbandry (e.g., general patient hygiene, feeding, management of diseases transmission between pens/properties) • New horse or lifestyle block advice (including vaccination, microchipping, etc.)
Interventions and technical skills	
<ul style="list-style-type: none"> • Assisted calving • Assisted lambing • Banding castration • Embryo transfer preparation, flushing • Equipment maintenance and/or calibration – both in practice equipment and mobile equipment • Hoof evaluation and corrective trimming – cattle • Lifestyle-block services (e.g., weighing stock, alpaca claw trimming, nose ring pigs) • Minor wound debridement • Nursing metabolic (downer) cows 	<ul style="list-style-type: none"> • Removal of auxiliary heifer teats • Splinting and casting of calves • Semen collection • Tail docking • Performing non-surgical artificial insemination, routine on-farm discharge from care (e.g., teat sealing, disbudding advice) • Post-operative check and suture removal visit • Wound flush • Wound dressing and bandaging changes
Pharmacology	
<ul style="list-style-type: none"> • Administering intravenous injections • Controlled drugs – administering, preparing and record keeping 	<ul style="list-style-type: none"> • Dispensing medications for clients* • Handling medications and explaining medications to clients
Surgery	
<ul style="list-style-type: none"> • Sterile assistance in surgery (scrubbed in) • Surgical site preparation 	<ul style="list-style-type: none"> • Surgical recovery

**It should be noted that all RVM pharmaceutical dispensing should have a double-checking process of the drug, dose rate and route of administration regardless of whether a vet or AVP dispenses it prior to administration, and this is assumed in the allocations.*

Table 5. Non-veterinarian but less-skilled tasks.

Cleaning/hygiene/sterile supply	
<ul style="list-style-type: none"> • Cleaning – non-customer-facing areas of practice • Cleaning surgical instruments • Packing and sterilisation of instruments and gowns 	<ul style="list-style-type: none"> • Veterinary vehicle restocking/veterinary vehicle inventory • Veterinary vehicle cleaning
Diagnostics	
<ul style="list-style-type: none"> • Californian rapid milk testing • Colostrum refractometry • Non-invasive sample collection (e.g., faecal, free-catch urine) • Plating, culture and sensitivity of milk • Preparing lab sample labels and forms 	<ul style="list-style-type: none"> • Running in-house blood tests • Sample preservation (histology) for sending • Urinalysis (dipstick + USG) • Urine sediment slide preparation • Urinalysis (machine analysis)
Interventions and technical skills	
<ul style="list-style-type: none"> • Animal restraint and handling • Assisted feeding (e.g., NG tubes) • Disbudding: calves, lambs, kids • Dehorning • Dairy teat scoring 	<ul style="list-style-type: none"> • Dry cow therapy/teat sealing • Non-infectious patient husbandry (e.g., general patient hygiene, feeding) • Hoof evaluation and corrective trimming – sheep • Hoof trimming for maintenance – cattle
Pharmacology	
<ul style="list-style-type: none"> • Administering oral medications 	<ul style="list-style-type: none"> • Administering ocular medications
Research	
<ul style="list-style-type: none"> • Collection of research data 	
Surgery	
<ul style="list-style-type: none"> • Non-sterile assistance in surgery 	

Table 6. Customer-service staff.

Communication	
<ul style="list-style-type: none">• Answering incoming phone calls initially• Booking and maintaining routine events, such as disbudding season and teat sealing season• Arranging routine reminders (e.g., vaccinations)	<ul style="list-style-type: none">• Completing insurance forms• Co-ordinating care with other health care providers and specialists (e.g., hoof trimmers, farriers, dental technicians)
Finance	
<ul style="list-style-type: none">• Processing and taking payments• Following up outstanding payments	<ul style="list-style-type: none">• Explaining invoices to clients
Stock management	
<ul style="list-style-type: none">• Ordering RVMs• Restocking in the practice	<ul style="list-style-type: none">• Stocktake, rotation, etc., in clinic and in vehicles
Hygiene	
<ul style="list-style-type: none">• Cleaning – customer-facing areas of clinic	

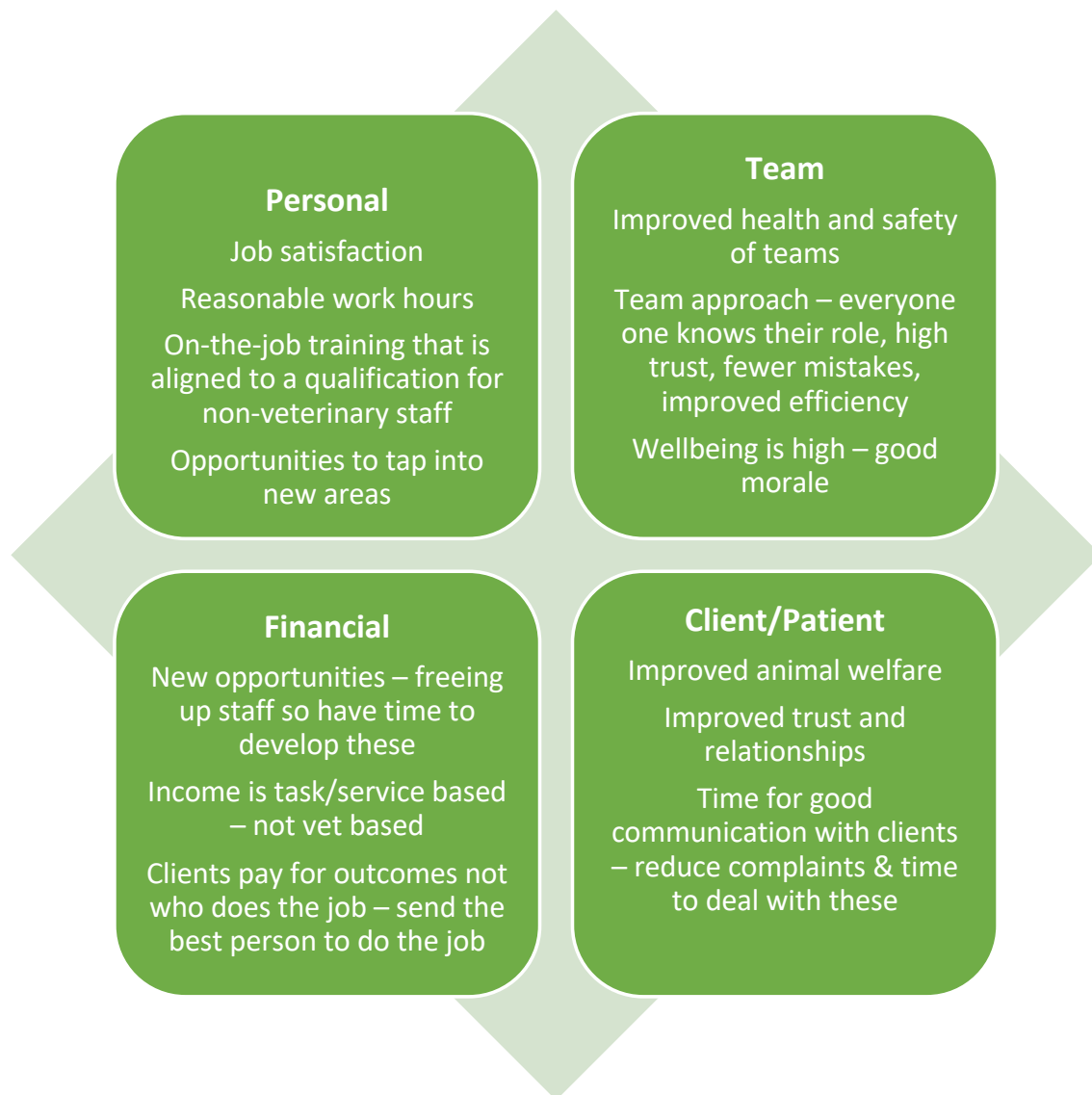


Figure 1. Outcomes when staff are utilised well in a rural animal veterinary practice.

Outcomes of excellent utilisation

The outcomes of an appropriate utilisation model were predicted by each focus group (Figure 1). The points raised by the different focus groups were similar despite participants holding different roles in the industry. These outcomes were categorised into benefits for individual staff (Personal), for the whole team (Team), for the business (Financial) and for clients and animals (Client/Patient).

Barriers preventing excellent staff utilisation

The barriers identified in the focus groups were grouped into themes shown in Table 7. This was the summary presented to participants for post-focus-group feedback. During the focus groups, the barrier discussions were similar, except that the employers were the only ones to raise as a barrier the risk that, once trained, technicians would go and set up on their own, and after-hours availability was raised as a barrier by the veterinarian participants rather than the technician participants.

Table 7. Perceived barriers to excellent utilisation in rural animal veterinary practice.

Perceived barriers to excellent utilisation in rural animal veterinary practice	
Disconnect between the current tech qualifications and industry's drive for specific skills, rather than a qualification	Current vet degree is not setting up veterinarians to be consultants, which is where they need to be
Lack of regulation of AVPs	Willingness of veterinarians to relinquish control
The current skills of all staff	Not enough technicians/non-veterinarian staff available
Lack of trust in technicians by veterinarians	The requirement for veterinarians to provide 24/7 after-hours service
Client expectations – the clients want the veterinarian	The techs we train are a 'flight risk' – i.e., they might leave and set up on their own

Discussion

In the current climate of veterinary shortages and reduced veterinary wellbeing in Aotearoa / New Zealand, veterinary practices stand to benefit significantly from higher staff utilisation. The role of this research is to drive actionable change and foster meaningful conversation across the industry in Aotearoa / New Zealand. It can be represented using the ABCD model (The Natural Step, 2014):

- “A” – Awareness and visioning. The awareness of the potential to improve staff utilisation; defining success in terms of excellent utilisation ratios and how that is operationalised in a utilisation model.
- “B” – Baseline mapping. Identification of where we are now and the current barriers to implementation.
- “C” – Creative solutions. Creation of potential mitigation strategies to overcome barriers to implementation.
- “D” – Decide on priorities.

While we progressed to step C in the similar work carried out for companion animal practice (Brown & Ma, 2023), in the case of rural animal veterinary practice, due to the significant variation in rural practice and potentially the more recent introduction of technical staff to support veterinarians in rural animal practice (as compared to companion animal practice), it was not

possible to progress to a proposal for step C in this study. Therefore, steps C and D lie outside of the scope of this research, and it is proposed that priorities are best determined by rural animal veterinary businesses individually, in their unique contexts. There is, however, an opportunity to extend this research further and create some individual practice case-studies, which may support veterinary practices to examine their own situations to open discussion and new viewpoints.

This participative action research, utilising end users, is one of the first attempts to examine and clarify the current understanding of role responsibilities in Aotearoa / New Zealand rural animal veterinary practices. The collaborative method employed by this research allowed end users to consider how to better utilise staff, the benefits of this, and what the barriers might be to implementing this. Unlike the companion animal version of this research (Brown & Ma, 2023), this research was not able to go as far as suggesting models. The potential reasons for this are:

1. The large diversity of rural animal veterinary practices, including species and geographical area covered.
2. The seasonal nature of much of the technical work.
3. The relatively new nature of rural animal veterinary technicians compared to the companion animal veterinary nursing sector (Matthews, 2005).

Role definitions and task allocations

When comparing the definitions created for the role of a veterinarian in this study, there are some variations to the definition created in the similar companion animal study (Brown & Ma, 2023). The key difference was highlighting the prevalence of veterinary authorisations that occur in rural animal practice. Even though companion animal veterinarians could technically do this, it is not prevalent due to the differing nature of the practices – being onsite based as opposed to field based.

The role definition created for a RAVT highlights the fact that these qualified technicians are frequently working on farm, without a veterinarian in the vicinity, and leading teams of technicians with varying skills/qualifications. In many cases they may be on farm more than the veterinarian, hence the potential for them to be the primary relationship holder. For veterinary nurses in companion animal practice, they are primarily working in the same building as the veterinarian, albeit with the veterinarian not always present (Brown & Ma, 2023).

Where in companion animal practice (Brown & Ma, 2023) the role of the assistant to a veterinary nurse (AHCA) was very clear to the participants, this was not at all so for the participants in the rural study. They focused on 'less-skilled tasks' and staff that may be employed casually to fill gaps, rather than a clearly defined role. This began to raise the question as to whether this is due to the relatively new technical-staff sector in rural animal veterinary practice, with roles still evolving, or whether rural animal practice has completely different needs to companion animal practice. In addition, education was not a primary driver of employment – rather, the skills the person came with and the skills that could be trained. This led to the study moving away from trying to classify the roles and tasks against existing qualification titles, and towards grouping skills.

Unlike the companion animal veterinary industry, where the roles to support veterinarians are reasonably well understood and defined, having formal support staff in the rural veterinary industry is relatively new. This has probably impacted the lack of clarity in the focus-group participants with regards to assigning tasks to roles, along with the propensity to hire unqualified people with farm experience for roles and training them for specific tasks. This resulted in assigning the tasks to 'skilled' and 'less-skilled' tasks, rather than under specific role names that align to the NZQA framework qualifications. It also raises questions as to whether the current solution for education for rural animal technicians, which aligns with companion animal veterinary nurses, needs a significant

review, given how different the needs of these different types of veterinary practices are.

Formalisation of education is becoming a topic of conversation for rural animal technicians, as a case for statutory registration is made to the New Zealand Government by the Veterinary Council of New Zealand (VCNZ). However, even without formal registration of veterinary technicians, the expectations of VCNZ are that a veterinarian has assured that training for tasks delegated to technical staff is sufficient, as the responsibility still lies with the veterinarian's professional registration.

The conversations in these focus groups support the premise that staff are often hired for specific tasks and undergo in-house training prior to undertaking tasks for clients. This in-house training is not currently standardised between businesses or approved anywhere, although there is a move to develop Edu-Badges to support this standardisation through the New Zealand Veterinary Association Continuing Professional Development Platform (New Zealand Veterinary Association, 2023). This does suggest there is a need for more work between tertiary education providers and industry on the way to formally educate technicians to ensure they have attained specified standards and that they gain transportable recognition for their specific training.

Outcomes of appropriate utilisation

The perceived benefits of appropriate utilisation, shown in Figure 1, are widespread across all areas of the veterinary practice. The four main categories of positive impacts – Personal, Team, Financial and Client/Patient – align with the companion animal utilisation research (Brown & Ma, 2023) and the main themes that Krekel et al. (2019) found. There were, however, some additional points within the high-level themes highlighted for rural veterinary teams. Recognition of opportunity for improved health and safety was highlighted when the teams were resourced well, and the right people were tasked to the roles. This was also acknowledged as improving efficiency and reducing mistakes, which have benefits for the team, as well as the clients and animals. The opportunity to expand the scope of services offered by the veterinary practice was also a strong theme in these focus groups, with wide acknowledgement that there are many opportunities currently missed when utilisation is not optimised. Examples cited by focus-group participants include:

- Compliance work.
- Consultancy work – analyse and make practical suggestions for data being collected (e.g., from collars), focus on animal health and welfare but will incorporate water and environmental management as this impacts animal health and welfare.
- Lifestyle-block consultancy and animal healthcare plans for these smallholdings, implemented by the technician team.
- Development of experts in areas such as winter grazing, runoff/water management, shelter.

Based on these themes, measures of success of optimising utilisation could include staff wellbeing surveys (measuring improvements in personal wellbeing and team function), client satisfaction surveys, and financial metrics (such as profit margins for specific services). Determining success should start with the collection of baseline information on each of these and repeating the measures regularly.

Models would vary depending on the specific practice profile but in a scenario where veterinarians only do veterinary only work, the participants agreed that there would likely be a minimum of three, but likely more, technicians/animal healthcare assistants per veterinarian to carry out current tasks.

The participants identified that the future of farming needs integrated on-farm support, where the veterinarian as the animal healthcare expert is working closely with the farm financial advisor, farm environment advisor and others to create an integrated plan for the farm. This aim of this collaboration would be to formulate a comprehensive farm plan that minimises the need for last-minute interventions by fostering a proactive approach. The technicians and animal healthcare assistants are the people who would implement the animal healthcare plans alongside the farmers, meaning a team approach rather than a vet-centred approach. The model will be service-fee generating, not vet-fee generating, therefore, the best person for the job provides the service and the service fee is charged.

Because the use of technicians is still a growing and developing field, it would seem reasonable to make the proposition that 3+:1 is likely a conservative ratio of technicians to veterinarians. As the opportunities for new business are realised, alongside the improvement of training, registration and understanding of scopes of practice, there will be even more technicians employed per veterinarian.

Barriers to excellent staff utilisation

As discussed in the introduction, appropriate utilisation of staff has shown a strong correlation between staff wellbeing and job satisfaction (Brown, 2020; Page & Vella-Brodrick, 2009; Grawitch et al., 2006; Nelissen et al., 2017). Further to that, Krekel et al. (2019) carried out a comprehensive meta-analysis of 339 independent research studies and found a strong positive correlation between employee satisfaction, employee productivity and customer loyalty, which ultimately led to better profitability.

However, many barriers appear to exist in the transition to appropriate utilisation and the benefits of it, and these are summarised in Table 7. Like the outcomes of appropriate utilisation, the barriers align with those identified in the companion animal research (Brown & Ma, 2023), other than physical building capacity, which is likely to be related to the majority of work in rural animal veterinary practice being field work, and financial barriers, which did not appear to be a concern in rural animal veterinary practice. However, the rural veterinary practice focus-groups raised additional barriers focused on the current veterinary pathway not setting up veterinary graduates to transition from technically competent veterinarian to consultant; the disconnect between current technician qualifications and rural animal veterinary practice needs, which are currently specific skill-sets that could potentially be attained in smaller bites of learning; and the risk of technicians leaving to set up on their own after the practice invests in training.

Following the focus groups, the researchers suggested potential approaches to the barriers, and these were presented to the focus-group participants after the focus group for individual feedback. As the response to the post-focus-group feedback was minimal (Table 1), the proposed mitigations are presented as discussion rather than results. Table 8 proposes mitigations for the barriers identified by the participants.

Table 8. Proposed barrier mitigation to realise excellent staff utilisation in rural animal veterinary practice.

Disconnect between the current technician qualifications and rural animal veterinary practice drive for specific skills, rather than a qualification	
<ul style="list-style-type: none"> Undertake further co-design work with industry to understand the skills and tasks and ensure associated qualifications and training is fit for purpose. 	<ul style="list-style-type: none"> Formalise on-the-job training so it is linked to completion of formal qualifications needed for insurance and potential future regulation.
Current veterinary training pathway is not setting up veterinarians to be consultants, which is where they need to be	
<ul style="list-style-type: none"> Interprofessional education during training, so vets can see that many roles they are exposed to are actually done by technical staff, so it's not a long-term role for vets, even if they need get to grips with those skills as new grads, it's clearly seen as part of the pathway to consultancy rather than a career end-point. 	<ul style="list-style-type: none"> Consider postgraduate qualifications as the norm like in human medicine? A base degree is completed as it is now and then everyone chooses tracks and does postgraduate certificates or higher to build on the base degree.
Lack of regulation of AVPs	
<ul style="list-style-type: none"> Support VCNZ and AVPRC in moving towards regulation of AVPs 	<ul style="list-style-type: none"> Use a voluntary framework ahead of formal regulation of AVPs to drive standards
The current skills of all staff	
<ul style="list-style-type: none"> Professional development/training plans for all staff Apprenticeship-type training – where on-the-job training aligns to formal qualifications for technical staff Move towards ensuring all staff are qualified Formalised training for specific technical tasks 	<ul style="list-style-type: none"> Develop focus areas for vets. For example: Only a few will be on tools/ambulance at bottom cliff (mindset shift) Consultancy training for vets – including data analysis Develop charging scopes to replace all the free consultancy vets currently do (on phone, at front counter, etc.)
Lack of trust in techs by vets	
Examine what this is caused by. For example:	
<ul style="list-style-type: none"> Control? Skill level of tech or even of vet? 	<ul style="list-style-type: none"> Fear of losing some jobs the vet likes to do even if they are technician tasks? Focus on solving actual issue

Client expectations – perception that the clients want the vet to attend	
<ul style="list-style-type: none"> Challenge this mindset – this was not a universal barrier presented by the focus groups, nor the experience of all participants in this research 	<ul style="list-style-type: none"> Proposition: If the veterinarian/practice trusts the tech, the client will trust the technician
Willingness of vets to relinquish control	
<ul style="list-style-type: none"> Find out why – i.e, it may be own skill set or perhaps own preferences 	<ul style="list-style-type: none"> Mindset change – in rural practice only a few can be ‘James Herriot’, the image of a rural animal veterinarian needs to change so seen as animal health consultants
Not enough techs/non-vet staff available	
<ul style="list-style-type: none"> Create attractive roles/packages including on-job training Marketing the opportunities 	<ul style="list-style-type: none"> Create entry-level positions with training on the job aligned with a formal qualification Help develop a connection to the community
After-hours provision	
Apply a systems approach to providing a 24/7 after-hours service to evaluate the provision. Some example questions as part of the evaluation include but are not limited to:	
<ul style="list-style-type: none"> What could actually be done by a non-vet? What could be done by remote medicine? What after-hours calls could be avoided by better triaging? 	<ul style="list-style-type: none"> What after-hours calls would be avoided by better animal health plans that modify husbandry practices? (E.g., oversized calves needing assistance, etc.) What is the minimum viable rotation for veterinarians on call
The techs we train might leave and set up on their own	
<ul style="list-style-type: none"> Create a role that would make it unattractive to leave – ask your valued technicians what they want/need to keep them in the team 	<ul style="list-style-type: none"> Career progression is important – this should include ownership/share options

	Urgent	Not urgent
Important	QUADRANT 1 Important and urgent DO	QUADRANT 2 Important but not urgent PLAN
Not important	QUADRANT 3 Urgent but not important DELEGATE	QUADRANT 4 Not urgent and not important ELIMINATE

Figure 2. The Eisenhower decision matrix.

Although some of these mitigation strategies require input and change from educators and regulatory bodies, many are measures that should be evaluated using a systems approach and implemented within the individual business. Time is a precious resource in the veterinary industry. Staff are constantly busy meeting the immediate demands of clients and providing for the immediate needs of animals. Ultimately, this generates business income. These tasks are important in nature and have an aspect of time-urgency. However, if a business spends all its time on immediate needs, it reduces the time spent on other issues that are highly important as well, but are less time-urgent. Therefore, these meaningful projects are often delayed.

The Eisenhower Decision Matrix (Figure 2) is a useful framework for illustrating how tasks and projects should be prioritised to enable businesses to improve (Eisenhower, 2017). When veterinary practices are constantly operating in the “Do – Important and urgent” quadrant, they are unable to attend to tasks in the “Plan – Important but not urgent” quadrant. In a clinical setting, the “Plan” quadrant may be seen as tasks that will not result in adverse patient outcomes if delayed. Therefore, these tasks may never be completed, or may be forgotten about altogether. However, “Plan” tasks are important for improving all work outputs of the “Do” quadrant that the team is performing daily. These may include setting team expectations, strategic planning, addressing issues with process and conducting clinical audits. It is essential for businesses to schedule time to work within the “Plan” quadrant.

A universal starting point to improve staff utilisation is the practice vision and values (Brown, 2020). Achieving a clear values framework is crucial for developing behaviour expectations and culture within a team – commonly addressed as ‘the way things are done here’. This is essential to establish before working on the evaluation of the system and operational details.

The barriers relating to lack of trust, by both vets and clients, is an example of the need to use techniques such as the ‘five whys’ (Lean Enterprise Institute, 2022) to determine what the actual barrier is, and what needs to change to improve trust. Lack of trust is the foundation in the model of the five dysfunctions of a team described by Lencioni (2010). A team without trust is dysfunctional and does not promote psychological safety of staff in a workplace. Developing a team with high levels of trust is pivotal to success in all areas of the business.

One of the reasons for lack of trust is related to the perceived skill of the person. Career-development plans are important for all staff at all stages of their careers within any business and will help support both individual and business success (Serbes, 2017). This will also help to mitigate the barrier of the risk of trained technicians leaving to go and set up on their own, by providing them with a career pathway and training, and a platform to be valued in a business.

Outside of the individual practice setting, the educator focus-group acknowledged that the animal healthcare and veterinary nursing education sector currently has a lack of consistency of training across Aotearoa / New Zealand, resulting in the lack of

consistency of graduates. Work is currently underway at Te Pūkenga (Te Pūkenga, 2023) to address this through the unification of training programmes within Aotearoa / New Zealand. However, discussions in the employer and employee focus-groups suggested that it is more than just lack of consistency, but the current training programmes are not meeting the needs of industry. Smaller bites of learning that align to skills, where learners can get formal recognition of the skill and standards are maintained, could solve this, rather than larger qualifications. Perhaps a better model would be bites of learning that can be added to, to eventually build a qualification, rather than enrolling in a whole qualification. This aligns with the common practice of rural animal veterinary practices often employing people from their communities who have a farming background as technicians. This is not to say a qualification set up for school leavers is not also valuable, but it needs to be complemented with an alternative pathway that fits with technicians employed by a practice without a formal qualification.

When it comes to clients' trust, a vet needs to be able to demonstrate trust of technicians in front of clients. If clients see that the vet trusts their technicians' skills, then clients will also extend trust to technicians. Bulińska-Stangrecka & Bagieńska (2019, para. 1) state that "a trust-based team generates effective cooperation, and as a result organizational innovation is strengthened." This is a pertinent point when considering the barrier of trust. The need for effective co-operation and innovation within veterinary interprofessional teams is essential to realise the model presented in this research.

The absence of formal registration was also cited as a reason why vets will not delegate tasks to technical staff, as vets understand that they are legally responsible for any risk. This is further compounded by the lack of trust within teams. If team members trust that each person is adequately trained within their scope of skills, then lack of registration should not be a significant barrier to delegating appropriate tasks. Currently in Aotearoa / New Zealand, the Allied Veterinary Professional Regulatory Council sets the standards for obtaining and maintaining registration (Allied Veterinary Professional Regulatory Council, 2020). However, registration is only on a voluntary basis and only aligns to qualifications, rather than limited skill scopes (for example someone trained to do teat sealing). This gap is being met by Edu-Badges that are run by VetLearn (New Zealand Veterinary Association, 2023). There is an opportunity for the industry to come together and decide what the

standards are and how they are met, and to use the same system, rather than every practice being burdened by individual training programmes.

The barrier identified with veterinary training pathways is interesting to consider. It may be that it is not the degree contents per se that are contributing to this barrier, but the deliberate or subconscious expectation that a veterinarian does technical tasks, rather than the mastering of technical tasks being just part of the journey of moving past a technical role as they develop their career into a more consultancy-style role. It was repeated constantly in the focus groups that veterinarians do need to master the technical skills, so it seems likely in a rural veterinary practice with excellent utilisation that new-graduate veterinarians may spend much of their first year or two doing technical tasks alongside the technicians as part of their career progress, before identifying a track and shifting their professional development and time on the job into less technical more advisory areas. Training around working within interprofessional teams as part of undergraduate education and continuing professional development will also help build trust within a team (Kinnison et al., 2016). All team members would learn how their roles interact and how each team member is essential to the overall outcome for animal welfare.

Based on the focus-group discussions, the requirement for veterinarians to provide 24/7 after-hours service is likely to be the biggest barrier and requires a systems approach to solving. The conversations revealed the presence of some fixed mindsets from many participants. Table 8 outlines some of the questions that could be asked when starting an examination into the barriers, and what the opportunities and ways to change might be. Prior to moving into 'what' questions, it is useful to use the 'five whys technique' (Lean Enterprise Institute, 2022) to discover the root of the problem. As one participant explained after the focus groups, the way forward is to define what the minimum viable product is for after-hours service, in terms of the minimum number of veterinarians required to operate a viable and acceptable after-hours service; however, defining this minimal viable product requires digging past bias, which is where the 'five whys' technique. is useful.

Limitations of this study

The small numbers of participants and the fact that they were 100% European represent limitations of this study. Jillings et al. (2021) identified that Māori and Pasifika were under-represented in veterinary science applicants, while

Europeans were over-represented, which likely explains the bias towards European participants. Without other ethnicities present in the discussion there is a risk that the results may be skewed to a New Zealand European perspective. Increasing the diversity of participants should be explored in future studies.

The self-selection criteria of experience with excellent utilisation (a minimum of three technicians per veterinarian) was applied loosely in this study, as it was difficult to find people who fitted that criterion, so participants self-selected if they felt they knew how to apply appropriate utilisation in rural animal practice. Some of the findings, particularly in the pre-focus-group survey suggest that these participants may not have been aware of what they didn't know, and thus the findings may in fact not be as aspirational as is needed to really maximise appropriate utilisation.

Focus groups were arranged into educators, employees and employers, to reduce the risk of power imbalance between participants, particularly between employers and employees; however, where groups consisted of both vets and technicians, the risk of power imbalance remained. To mitigate this, other participants were able to give feedback individually during the post-focus-group reviews. This feedback did align with the results and themes from the focus-group discussions so this is unlikely to be a major issue. Educators, employees and employers are also likely to have different drivers that influence their perspectives. As well as addressing the gaps in representation, and increasing the numbers of participants, future studies could also separate vets and technicians to further test this assumption.

Conclusion

The use of rural animal technicians in rural animal veterinary practice in Aotearoa / New Zealand is relatively new compared to their use in companion animal veterinary practice, and with no obvious international models to compare to, and greater variation in practice scopes, it will take time to optimise staff utilisation for each individual practice. However, improving utilisation in rural animal veterinary practices will have significant benefits for individual staff, the team, clients and their animals, and the rural animal veterinary business, so is worth the veterinary practice investing time in. A major shift needs to be made in Aotearoa / New Zealand rural animal veterinary practice to move to excellent utilisation, with an increase in non-vet staff per vet staff.

Although full and appropriate utilisation of staff is only one piece of the puzzle to improving staff wellbeing, it is an essential one.

To enable this shift, a significant number of the barriers need to be mitigated by individual businesses. Further structural changes around education and regulation of AVPs are needed to create the framework to drive change; however, individual practices should not wait for this latter change to happen before instigating their own changes. Individual business improvements can be implemented that are not reliant on the external frameworks. Spending time, as a whole practice, on planning and harnessing the skills of the entire team to co-create the changes will allow shifts in utilisation to happen. The research presented in this paper can serve as a point of reference for assessing the objectivity with which tasks are performed in practice and determining the most appropriate staff members to perform these tasks.

Further research

Future research should conduct individual rural animal veterinary practice case-studies showing how they operationalise and measure the success of excellent utilisation. These case studies should examine the practical application of the research, placing emphasis on the progression through the ABCD model; particularly the innovative approaches adopted and the subsequent determination of priorities. It should also analyse the metrics used to gauge the outcomes and success.

Focus groups with education providers and industry employers should be utilised to explore the barriers pertaining to ensuring qualifications that meet the needs of the employers.

Acknowledgements

This research was approved by Otago Polytechnic Research Ethics Committee (approval number 944).

Thank you to Dr Jane Jones BVSc, Dr Sylvia Ma BVSc, Selena Johnson NZ Cert. RAT for your support in the focus groups taking notes, and to Laura Dickson for editing support.

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