



## **Communication and engagement in livestock export regulation**

Submission by Vets Against Live Export Inc.

December 2022

Vets Against Live Export Inc  
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Mr Ross Carter  
Inspector-General of Live Animal Exports  
18 Marcus Clarke Street  
CANBERRA ACT 2601

1 December 2022

**Re: Communication and engagement in livestock export regulation**

Dear Mr Carter

Thank you for your invitation to make a submission to this Review.

Vets Against Live Export (VALE) was established in 2011, following the revelations of serious cruelty inflicted on Australian animals exported to Indonesia. VALE currently has over 200 veterinarian members.

VALE welcomes the opportunity to provide information on this review. We have documented historic and ongoing response failures by the Department of Agriculture. VALE has seen little or no improvement in Department responses to the public, animal welfare stakeholders or issues of poor animal welfare and non-compliance in the live export trade.

Yours sincerely

Dr Sue Foster BVSc MVetClinStud FANZCVS  
(Spokesperson)

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## **POINT BY POINT RESPONSE TO INSPECTOR GENERAL of LIVE ANIMAL EXPORTS (IGLAE) REVIEW: Communication and engagement in livestock export regulation**

### **1. Stakeholder communication and engagement policy – Live Animal Exports approaches employed to engage stakeholders**

VALE was incorporated in 2012 after extensive academic research into live export that concluded consistent and recurrent regulatory failure and consequent animal welfare abuse in the live export trade. From 2012 to 2021, despite making submissions to nearly every live export review by the Department of Agriculture (various official titles and acronyms but hereafter referred to as “the Department”) and repeatedly uncovering Department misinformation in the public domain (eg the discrepant mortality figures in the initial High Mortality Voyage Report and the relevant Parliamentary Report for High Mortality Voyage 65)<sup>1</sup>, VALE was persistently ignored by the Department of Agriculture as a legitimate stakeholder. Until 2022, VALE had to rely on notification from the media or other veterinary or animal welfare organisations of reviews by the Department. In 2022, the Department has actively engaged with VALE as a legitimate stakeholder. VALE has welcomed this move and believe this to be a genuine improvement. However, communication and responses to date are still inadequate as per Point 2.

VALE has observed that the most critical live export reviews with public submissions invited routinely have short time periods for submission (eg ASEL Update Review, Sept 20 to Oct 18<sup>2</sup>) and are often over the Christmas/New Year period (including but not limited to the Northern Hemisphere Prohibition period review<sup>3</sup> (Dec 17 to Jan 28), Livestock Export Licences and Livestock Export Approved Arrangements<sup>4</sup> (Nov 22 to Jan 31) and the current Export Control Act Review<sup>5</sup> (Nov 28 to Jan 20). The timing of these reviews for public comment is too repetitive to be coincidental and would appear to benefit the businesses involved and discourage meaningful submissions from welfare organisations, voluntary organisations and the public who unlike the businesses do not have paid staff to prepare these documents.

It should be noted that VALE has consistently been notified by the IGLAE of all upcoming IGLAE reviews and has appreciated the responses by the IGLAE to issues raised.

### **2. Response to inquiries, reports, complaints, and allegations of non-compliance – the investigation of complaints and allegations of non-compliance in livestock export regulation**

The Department has had a long history of inadequate responses, delayed responses or no responses to inquiries, reports, complaints, and allegations of non-compliance from VALE extending back to its inception in 2012. Many but not all of these are listed on the VALE website under Government Correspondence (<https://www.vale.org.au/gov->

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<sup>1</sup> See: <https://www.vale.org.au/high-mortality-voyages.html>. Voyage 65. Accessed 30 Nov 2022.

<sup>2</sup> See: <https://haveyoursay.agriculture.gov.au/2021-asel-update>. Accessed 30 Nov 2022

<sup>3</sup> See: <https://haveyoursay.agriculture.gov.au/nhs-prohibition-review>. Accessed 30 Nov 2022

<sup>4</sup> See: <https://haveyoursay.agriculture.gov.au/iglae-review>. Accessed 30 Nov 2022

<sup>5</sup> See: <https://haveyoursay.agriculture.gov.au/improving-the-export-control-rules>. Accessed 30 Nov 2022

[correspondence.html](#) with transcript in Appendix A – links available if viewed digitally). VALE's documentation of responses on the VALE website should be regarded as typical for the Department and very damning evidence of 10 years of systemic response failures that continue to date. The persistence of VALE and the obstruction by the Department as evident in VALE's enquiries about stockperson substitution (Dec 2012 to April 2014; see Appendix A) are little different to those pertaining to VALE's request for information about Independent Observer (IO) Summary 197 (March 2020 to present; see Appendices A and B).

With respects to responses to specific incidents, the Department responses on every occasion of which VALE is aware, including that to the *Awassi Express* incident, have favoured the exporter even when there have been clear breaches of the Australian Standards for the Export of Livestock (ASEL) or Exporter Supply Chain Assurance System (ESCAS). Compliance is not taken seriously and inappropriate penalties (eg cancelling the licence of one exporter but allowing the exporter to trade under licence to another related or integrated export company) or no penalties are applied (see Point 3). In addition, the Department routinely sanitises all reports in the public domain as is evident from the IO Summaries (see correspondence in March 2020 from VALE to the Department in Appendix A). Whilst the Department strenuously denied the allegation made in March 2020, the avoidance of the word "heat stress" in so many of the IO Summaries in which there were consistent ambient conditions for, and clinical descriptions of, heat stress is clear evidence that the Department is either incompetent (insufficient knowledge to diagnose/predict clinical heat stress) or does indeed sanitise information in the public domain. This is also evident from VALE's analysis of the draft and final reports of IO 197 (see Appendix B) which arguably indicate not just sanitisation but cover-up. It is also interesting that the High Mortality Investigation Reports have, since the *Awassi Express* exposé, been euphemistically rebadged as "Notifiable Incident" reports.

### 3. Systems, processes and timeliness of responses, and the nature of responses, to inquiries, reports, complaints, and allegations of non-compliance

There is no publicly available information about any of the systems and processes of response by the Department to any of the exporter or public communications thus responses of the Department cannot be assessed by any published process information. There is also no information as to who does the assessing of the various reports (eg daily voyage reports, IO reports, end of voyage reports) or in what time frame this occurs (do the daily shipboard reports get scrutinised on a daily basis by a member of staff with adequate veterinary, live export and animal welfare experience and knowledge?).

Some conversations with the Department have revealed that assessment of reports is not performed by personnel with adequate animal health, pathophysiology and pharmacology knowledge let alone animal welfare training. It should be noted that a veterinary degree (obtained at any time in the last 40 years) is not an animal welfare qualification. Veterinarians unfortunately are not automatically experts in animal welfare as highlighted recently by Littlewood and Beausoleil (2021)<sup>6</sup>. These authors state: "*Veterinarians are animal health experts. More recently, explicit references to veterinarians as animal welfare*

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<sup>6</sup> See: <https://pubmed.ncbi.nlm.nih.gov/34944280/> . Littlewood KE and Beausoleil NJ. Two Domains to Five: Advancing Veterinary Duty of Care to Fulfil Public Expectations of Animal Welfare Expertise *Animals* 2021; 8;11(12):3504. Accessed Nov 30 2022

*experts have proliferated. Veterinarians are ideally situated to act as animal welfare experts by virtue of their core work with animals, influence over owners, their roles in policy development, compliance, and monitoring, and as educators of future veterinary professionals. However, the discipline of animal welfare science has moved beyond a focus on nutrition and health towards an acceptance that the mental experiences of animals are the focus of welfare consideration....In summary, for veterinarians to be positioned as experts in animal welfare science, they need to first have a holistic and contemporary understanding of what animal welfare is and how it can be scientifically assessed. Veterinarians also need to be motivated to engage with the broader disciplines of animal welfare (science, ethics, policy, and law) and empowered to act as experts in their daily lives."* This valuable peer-reviewed article in a prestigious journal emphasises that having a veterinary degree per se is not an indication of animal welfare expertise or even knowledge. One contemporary example of this veterinarian failure in the field of animal welfare (and animal behaviour) is the repeated and incorrect assertion from Department veterinarians during the Review into the Northern Hemisphere Prohibition that it is not a welfare issue if sheep pant because dogs pant (information to be supplied confidentially to the IGLAE).

Given the lack of relevant information in the public domain, including any information on the welfare qualifications of Department employees in welfare roles, VALE can only use examples from its engagement with the Department in response to this part of the review. In the first instance, see response to Point 2 and Appendix A. For a contemporary example of the ongoing obstruction to obtaining information and failure to respond in a timely fashion, VALE refers the Inspector General to VALE's request for information dating back to March 2020 (Appendix B) regarding one single voyage (carrying IO 197).

In the public domain, there is clear evidence for long delays between the end of voyages and publishing IO Summaries (sometimes over 12 months), High Mortality Investigation Reports and ESCAS investigation reports. For example, as of 28 October 2022, none of the ESCAS Compliance Complaints in 2021, all made more than 12 months ago, had a completed investigation report. Likewise, despite an IO Summary section for 2022 on the Department website, as of 28 Oct 2022, there have been no IO Summaries uploaded onto the website and no information regarding how many are even pending.

It is telling that exporters can have an exemption to a Government order overturned in under a week including an appeal to the first decision (Al Kuwait June voyage 2020 exempt from Northern Hemisphere Summer Prohibition), but it took VALE, 2 requests, 6 revisions and 3 months (not to mention a substantial amount of money) to request a limited number of documents that in a democracy a non-government organisation or member of the public should be able to freely access and that access to further documents, justified on the basis of these initial documents, is still being obstructed 2 years later.

With respect to responses to non-compliance as opposed to responses to communications, the Department responses on every occasion of which VALE is aware favour the exporter even when there have been clear breaches of ASEL or ESCAS. Compliance is not taken seriously and no penalties are applied. However, it should be emphasised that ASEL has never been enforceable. It is notable that the Government withdrew proceedings against Emanuel Exports with respect to the ASEL infringements evident from the MV Awassi Express footage:

*"Following careful consideration of all the available evidence in accordance with the Prosecution Policy of the Commonwealth, the CDP concluded that it could not be satisfied that there were reasonable prospects of conviction of those alleged to have been involved."* Despite this obvious failure of legislation, the Government of the day and the Department chose not to reassess the legislation and determined that redrafting ASEL with 'more enforceable language provided a better approach for the regulator and industry.' They stated that *"This approach will ensure that animal health and welfare requirements can be met while also allowing for a more flexible regulatory framework that can readily facilitate continuous improvements."*

That "more flexible" regulation is most convenient for the exporters. This industry continues to be essentially unregulated with no legal recourse possible even when serious and sometimes avoidable animal welfare incidents are exposed. This is evident from contemporary High Mortality Voyage Reports. For example, High Mortality Voyage (HMV) 82 which occurred after the *Awassi Express* exposé:

*"The department required the exporter to prepare and implement a comprehensive buffalo management plan and additional monitoring, oversight and reporting for future buffalo consignments."*

That was the only action despite the fact that at the time the exporter had 8 "notifiable incidents" (one in the same ship reported as HMV 68) – 3 in buffalo consignments (including HMV 81) – and that *"In failing to hold 81 buffalo in the RP for less than two clear days prior to export, not rejecting inappropriate buffalo, and not adequately assessing the buffalos' fitness to load, SEALS have not complied with standards 3.8A, 3.1.1 of appendix 3.1, and 4.8 of ASEL."*

There is no mention of the fact that transport of buffalo in Condition Score 0-1 is non-compliant with Australia's 'Fit to Load Guidelines' and that this exporter could potentially have been prosecuted under the relevant state's Animal Welfare Act. Exporters act with impunity both in Australia and whilst exporting. This degree of non-compliance with ASEL should, VALE's view, have constituted prosecution and/or loss of exporter licence.

As per VALE's submission to the Moss Review, VALE still recommends *"an urgent review of the entire legislative scheme applicable to live animal export. The present law is wholly inadequate to achieve good animal welfare in the sections of the trade which may continue and should be reviewed and completely rewritten. In particular, the law should include a power allowing the independent regulatory body to impose on-the-spot penalties for breaches of relevant law. Currently, breach of live export licence conditions can only be penalised after a criminal prosecution."*

#### 4. Information web pages

The Department's live export website has never, since 2012, had less information. If one searches "live export trade" there is no information on compliance, mortality reports, the independent observer program or ESCAS at <https://www.agriculture.gov.au/agriculture-land/animal/welfare/export-trade> (accessed 28 Oct 2022). One has to specifically search exports and then go to livestock exports (not *live export*, the term used consistently in the media, by the public and by the Department itself). For the most contentious of all

Department activities, in a trade noted to require social licence for its continuation, information on live animal export is poorly presented in a most obscure location/domain that should be rectified. There is no clear information on processes or personnel anywhere on the website.

In addition, the Department has had a long history of regularly changing URLs and web layouts and removing relevant reports from public access. This prompted VALE to ensure that the most critical Department reports in the public domain are available permanently on VALE's website. VALE's website has been used both nationally and internationally (eg by the National Society for Prevention of Cruelty to Animals (NSPCA) in South Africa) to source information from the Department that is either difficult to find or no longer available on the Department's webpages.

In the compliance investigations, <https://www.agriculture.gov.au/biosecurity-trade/export/controlled-goods/live-animals/livestock/regulatory-framework/compliance-investigations>, there is a framework that concludes at criminal investigations. There is no information that since the start of this trade there have been no criminal actions taken by the Department. The court case of *Animals Angels v Secretary Of Department Of Agriculture* (2014) found that there was no requirement for the Department to take action even when compliance breaches that would justify criminal prosecution have occurred. There is also no mention that no penalties other than criminal prosecution are available. Historically, the Department's response to ASEL infringements and high mortality voyages was always a decrease in stocking density for the next voyage (an indirect financial penalty on one voyage and of little animal welfare consequence).

It is most concerning that documents pertaining to live export that have been released by the Department regarding live animal exports are no longer easily available on the website. The Department historically published links to all documents pertaining to live animal exports and retrieved under the *Freedom of Information Act* 1982. Such reports could then be accessed by the general Australian public and not just the organisation/person that requested them. This policy appeared to cease after the *Awassi Express* exposé in 2019 and currently there is no repository of live export documents released to the public that is easily accessible. This should be rectified as a matter of urgency. It would appear to support the claim that the Department has no will for transparency.

## 5. Privacy and confidentiality policy

The Department's privacy and confidentiality policy is used repeatedly to block enquiries from veterinary and welfare organisations. An example is VALE's urgent enquiry about the apparent length of voyage of the *Dareen* (see Appendix A and <https://www.vale.org.au/gov-correspondence.html>) which resulted in the provision of scant information. Dr Tina Hutchinson explained in a phone conversation to Dr Sue Foster (VALE Spokesperson) in June 2022 that this was due to privacy concerns. Likewise, the apparent failure to provide Australian Maritime Safety Authority (AMSA) with information on the fire safety risk detailed in an IO report was also initially attributed, in a phone conversation with the Department (June 2022) to a privacy issue ie privacy preventing information sharing with another Department about a compliance issue in their jurisdiction. When this issue was raised with another Department employee (September 2022), this explanation was refuted and it was



stated that privacy should not prevent this information being relayed between Government Departments/Authorities.<sup>7</sup>

VALE notes that the privacy policy has also cited as a reason not to publish adverse welfare events and photographs in IO Reports in the IO Summary.

## **CONCLUSION**

Despite ongoing and recurrent evidence of Departmental failures to protect Australian animals in the live export trade (and repeated media exposures of these failures), responses have not substantially changed between 2012 and 2022. The Department has always had a conflict of interest favouring promotion of trade and not regulation of the trade. Reviews, review processes and their timing, and responses to non-exporter stakeholders are further evidence of selective stakeholder engagement bias. This continues to date as evident from all contemporary responses available.

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<sup>7</sup> Note: it was later clarified verbally by phone that AMSA had indeed been notified despite lack of comment in the IO Summary and the original explanation of privacy.

## **APPENDIX A: VALE'S CORRESPONDENCE TO THE DEPARTMENT OF AGRICULTURE: As it appears on VALE's website**

Transcript of <https://www.vale.org.au/gov-correspondence.html>. Some format changes have been made for document clarity.

### **GOVERNMENT CORRESPONDENCE**

On this page is VALE's correspondence to and from the Australian Government Department of Agriculture and Water Resources.

### **VALE REQUESTS INFORMATION ON INDONESIAN ANIMAL WELFARE AND BIOSECURITY WITH FMD OUTBREAK**

(Reverse chronological order)

19th August 2022: written response from Tina Hutchinson to VALE

Thank you again for your email of 18 July. Indonesia represents Australia's largest cattle export market, which is part of a longstanding and significant bilateral relationship between the two countries. In addition, Indonesia relies on Australia to supply beef cattle which cannot currently be produced domestically to address its food security needs. Outbreak of serious disease is deeply concerning to both countries. The Australia Government continues to cooperate with Indonesia to combat the outbreak of foot and mouth disease, including through advice from Australian technical experts, supply of vaccines and offers of financial support. This is in addition to assistance already being provided to combat lumpy skin disease, that was detected in Sumatra. Furthermore, the Australian Government has co-funded a project with Meat and Livestock Australia to coordinate support from Australian industry for the Indonesian feedlot sector's emergency response to these diseases and to support Indonesian feedlots to access FMD vaccine.

In direct support of protecting the health of exported Australian livestock, and supporting Indonesian importers and feedlots manage the impact and spread of FMD, Meat and Livestock Australia has made funding available for a vaccine project to support importers to vaccinate Australian cattle entering Indonesian feedlots. This is in addition to over 40 000 vaccinations that have already been administered across Indonesian feedlots, with another 450 000 doses on order and expected within weeks.

In relation to your questions about livestock vessels and their crew, Australia has long standing biosecurity arrangements in place for international vessels, and these have recently been enhanced for livestock vessels. Specifically:

- all vessels entering Australian waters, including returning livestock vessels, become subject to biosecurity control and must therefore comply with Australia's strict biosecurity requirements.
- all livestock vessels, including those returning from Indonesia, are subject to heightened surveillance due to Indonesia's changed FMD status. This surveillance is in addition to the existing cleaning, disinsection and inspection requirements for livestock vessel that must be completed prior to or upon arrival in Australia and before the vessel is permitted to load livestock.

- all operational staff, including biosecurity officers who oversee returning livestock vessels have been provided refresher information about the risks posed by FMD;
- livestock vessels are required to enforce the use of footbaths at all times whilst vessels are in port in Australia including an additional second footbath at the top of the gangway on the vessel;
- biosecurity officers who perform biosecurity clearances of livestock vessel crews, including any accredited stockmen who return on the vessel, pay particular attention to any food, tools, foot wear and clothing given the biosecurity risks associated with these items;
- a publicly available industry advice notice ([IIAN 117-2022](#)) was published on 8 July 2022 setting out additional requirements for livestock vessels to manage the risks posed by FMD/LSD;
- furthermore, all international travellers, including accredited stockmen, accredited veterinarians and the crew of livestock vessels returning from Indonesia that enter Australia are not permitted to bring food products that may present an FMD risk – these products must be declared for inspection on arrival.

Overall, the Australian Government is exploring all practical measures that can be taken at the border, including the maritime border, to reduce the risk of FMD entering the country and will implement evidence based measures on a case-by-case basis. Advice continues to be taken from biosecurity experts and consideration will be given to any further practical measures that will genuinely reduce the risk of FMD and LSD entering Australia. State and territory governments, and the travelling public, will continue to be reminded of their obligations, noting that biosecurity is a shared responsibility.

15th August 2022: two phone call follow-ups to say response coming and that response has been delayed; BUT still no actual response

18th July 2022 VALE to Tina Hutchinson:

VALE is very concerned about the current export of cattle from Australia to Indonesia from the perspectives of Australian cattle welfare and Australian farm biosecurity. VALE would like to know:

1. why our FMD naive cattle are being exported to a country with an FMD epidemic – this is a serious animal welfare issue, especially given the limited animal health and care options in a Third World Country with a disease that has up to 100% morbidity.
2. what biosecurity measures are in place for difficult-to-disinfect cattle ships returning back from Indonesia.
3. what biosecurity measures are in place for the ship crew (eg returning Australian stockpersons and vet, ship's crew etc) when they disembark and what of Australian stevedores and stockpersons etc who will be on and off the ship when it reloads in Australia. We have not seen any EANs providing any extra instructions re ship disinfection, crew movements, quarantine orders etc relating to the Indonesian export trade and likewise have seen no specific EANs for procedures in Indonesia, where usually there is only a footbath of disinfectant (often muddy and easily stepped over) at the end of the gangway but nothing in place on the cattle ramps, a major entry and exit point for personnel.

On both animal welfare and biosecurity grounds, VALE believes that there should be trade suspension to Indonesia whilst the FMD epidemic is out of control. Boxed meat is an alternative that should be considered at this time.

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## **INADEQUACY AND INACCURACY OF GOVERNMENT INDEPENDENT OBSERVER SUMMARY 197**

(Reverse chronological order)

Nov 11 2022: follow up tele-meeting with the Department. AMSA communication confirmed.

Nov 2 2022: call from Acacia Pyner offering to meet up in WA with short notice – not possible for VALE but in a follow up call on 9 Nov 2022, a meeting was set up for 11 Nov 2022. Dept confirms verbally that they did notify AMSA of fire risk and MO 43 concerns but will clarify dates of their correspondence at the meeting on 11 Nov 2022.

October 31 2022: with no Department analysis and information forthcoming, VALE resorted to another FOI for voyage documents to enable independent analysis

Sept 2022: call to request meeting in WA with short notice – not possible but Dr Joffrid Mackett confirmed that the Dept were still working through VALE's complaint

14th August 2022: NO UPDATE

6 Jul 2022, at 5:51 am, Joffrid Mackett to VALE:

Just a quick email to follow up on the phone message I left with you the other day. As I mentioned in my message, and as indicated by Tina in her discussion with you, once we have gone through the document you provided we will be in touch to arrange a time to discuss it in detail. In the interim, should you wish to discuss this further I have included my phone number below in case it wasn't clear in my phone message. Please note I will be out of the office until next Wednesday (13 July), and will only have intermittent access to phone and email until I return.

17th June 2022: VALE to Dept:

I have attached VALE's comparison of the initial IO Report, the final IO Report and the Department's IO Summary for IO 197. VALE believe that any member of the public and any objective independent analyser would consider the IO Summary to be a misrepresentation of this voyage. The animal welfare issues were downplayed or excluded, personnel issues were excluded, the ship faults were not detailed and the fire risk omitted. VALE alerted AMSA to the fire risk situation on this ship which had undergone an extensive fire assessment after previously burning in Fremantle Port.  
Yours sincerely,

See also: **"Dept Strings Out VALE FOI Request: May To August 2020"**

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## **WHAT IS HAPPENING TO THE MV *DAREEN*: APRIL 2022: ISSUE RESOLVED SATISFACTORILY**

(Reverse chronological order)

16th June 2022: satisfactory verbal communications and explanation from Tina Hutchinson.

29th April: Tina Hutchinson contacts VALE to discuss. VALE agrees to a discussion in June as VALE unavailable to meet until June

25th April NO RESPONSE FROM DAWE

14th April 8:02 am WST VALE to Joffrid Mackett. Still no answer to the question.  
Email: "6 days and 5 emails later, VALE has still not had a straight answer to the question posed on Friday 8th April: **Were there cattle on the MV Dareen when it left Qinhuangdao Port for Shanghai Port?**

Could you please provide an answer to this question."

13th April 11:33 am WST VALE to Joffrid Mackett requesting clarification as to which port he was referring.

Thank you for that information. I assume you are referring to the port of Qinhuandao and not the port Shanghai ie that the cattle consignment was discharged at Qinhuangdao?

13th April 11:29 am WST Joffrid Mackett to VALE seemingly after complaint to Inspector General

I can confirm the consignment was discharged at the port.

13th April 10:13 WST From VALE to Inspector General  
Letter of complaint about lack of Dept transparency.

13th April 10:03 WST From VALE to Joffrid Mackett and Animal Welfare  
Thank you for your email. It is encouraging that the department has no animal health or welfare concerns with this consignment but I would also note that the Department is not always privy to conditions on board live export ships – as per the Awassi Express experience and the subsequent installation of Independent Observers onboard livestock vessels, a practice that was halted with the pandemic and has not been resumed.

As such, and as per my request, could you please confirm whether there were cattle on this ship when it left Qinhuangdao?

13th April 9:34 WST from Joffrid Mackett to VALE, excluding Inspector General, avoiding the question:

Thank you for your email.

The department monitors the progress of consignments of livestock exported by sea. For voyages such as the one you have enquired about, exporters must ensure a daily report on the health and welfare of the livestock and conditions on board is provided to the department. These reports are monitored by LAE Branch officers and where concerns or issues are identified the department takes appropriate action. In addition, exporters must

notify the department within 12 hours of a notifiable incident occurring. Such notifiable incidents include vessels that are having or are likely to have a shortage of feed.

I can confirm that the department had no animal health or welfare concerns with this consignment.

13th April 8:34 WST to Tina Hutchison and Animal Welfare Inbox, cc Inspector General:

There has been no response to VALE's email from 8 April 2022.

VALE note as of this morning that the MV Dareen is now moored in Shanghai but, if satellite information correct, alongside another ship ie would not be able to unload cattle (but could perhaps take on food). Lack of priority berthing has been noted in previous IO reports of Australian livestock voyages to China and is a recurrent theme in the NZ live export trade using the same ships on the same routes (as per recent documents obtained under FOI – see below).

Would you be able to update us as to the status of this ship – loaded vs empty.

8th April 12:11 WST to Animal Welfare Section and Tina Hutchison:

VALE has noted that the MV Dareen, which left Portland on 11 March 2022 is now sitting at anchorage in Shanghai port after spending some days at Qinhuangdao Anchorage and Port between 27 Mar and 2 April 2022.

Unless all the Portland cattle were unloaded at Qinhuangdao (unlikely if it then proceeded to Shanghai), there will be cattle onboard this ship, 28-30 days after being loaded at Portland (approximately 2 days of loading time). As you would know Shanghai is under very strict Covid lockdown measures. This is reflected in the unprecedented number of ships in Shanghai Anchorage, unable to enter port to be loaded/unloaded.

VALE has no information about how many days of extra provisions are on board the MV Dareen but 28-30 days would likely exceed the usual ASEL requirements of 3 days over the predicted time for China voyages. VALE also does not know if there is the possibility of loading extra fodder at Qinhuangdao but from analysis of China voyages (Hing et al 2021), it is evident that this would not be routine so it follows that it is likely unfeasible.

Could the Department please confirm the status of this ship – loaded with cattle vs empty – and inform VALE of what measures are in place to ensure that any cattle on this vessel have adequate food and water provisions necessary for the remaining number of days until unloading

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#### **DEPT STRINGS OUT FOI REQUEST FROM VALE: May to August 2020** (Reverse Chronological Order)

4 August 2020: FOI request finally accepted. Yep....exporters can have an exemption to a Govt order overturned in under a week but it takes VALE, 2 requests, 6 revisions and 3 months to request documents that we should be able to access in a democracy. Now lets wait and see how much it is redacted.

30 July 2020: Revision No 6



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30 July 2020: still no luck – DEPT to VALE:

Thank you for your revised FOI request. We wish to clarify that the attachments are part of the final draft report and not the first draft report. Accordingly, excluding the attachments from the first draft report will not alter the documents within the scope of your request. On this basis, do you wish to exclude the attachments from the final draft report?

We note that today is the last day of the consultation period. However, the department would be open to extending the consultation period if you consider it is necessary. If you wish to extend the consultation period, please let us know today.

28 July 2020: we try yet again – VALE to Dept:

It is difficult to understand how an attachment to the first draft could be so large when we have excluded photographs and videos from our request. However, as per your advice, please see the 5th revision of our request (attached) excluding the attachment.



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22 July 2020: still no luck:

Thank you for your revised Freedom of Information (FOI) request. We have made some further enquires, and your revised request is likely to still be too big for the department to process. This is largely due to the size of the attachment to the report and the number of third parties the department would need to consult.

If you were to revise your FOI request to exclude the attachment to the report then this may help us to process the request....

18 July 2020: we try again:

Dear FOI Team, In response to your advice (LEX-4467-24AA) that our current FOI request will be refused unless revised, VALE has revised the request, scaling it back to the bare minimum (see attached)....



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16 July 2020: Advised request too large again



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29 June 2020: FOI request resubmitted by VALE removing one voyage



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18 June 2020: FOI request refused after revision



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29 May 2020: refusal with offer for a scaled request:



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18 May 2020: requested two voyages with IO reports that appeared to have Dept sanitisation



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**17 June 2020: VALE follows up request and gets a response re AI Kuwait Exemption Voyage:**

VALE has not received your reply despite the assurance below. It may interest you that despite the intense spotlight and public interest, there were certainly sheep on the trucks going to Fremantle Port yesterday that had wool length >20mm (<http://www.vale.org.au/blog/good-to-see-conditions-being-observed>).

In addition to observing sheep with >20mm wool length, I observed the excellent body condition of the majority of the sheep. Prolonged feedlotting is likely to reduce inanition/salmonellosis but the flipside is that A class wethers are often the highest risk sheep during a heat stress event due to their fat cover.

The combination of greater wool length than the original shipment due to 2 week loading delay (ie wool continues to grow so this would be abnormally long for any routine shipment at loading), sheep with >20mm wool length, A class wethers and a Govt acknowledged high risk time of year makes it imperative that VALE's request for an independent observer and publicly available CCTV footage is granted.



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**13 June 2020: VALE requests Dept apply conditions to their *AI Kuwait* decision**





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### **5 March 2020: Dept replies taking umbrage at the suggestion of IO Report sanitisation!**

Thank you for your email. We are aware of the issues with the vessels as identified by the independent observers, and work closely with AMSA on matters that cross over into their responsibilities. The department is analysing the information obtained through IO reports, as you suggest. I would note that I don't agree with your characterisation that IO reports are sanitised.

The department is continuing to work on the IO program, including consistency of information capture and reporting, with temperature recording and reporting being an example of one area of focus. Thank you for your suggested approach to managing issues such as ventilation, hot spots and drainage – there are a number of ways we follow up on these issues; directly with specific exporters, generally with all exporters and with AMSA and vessel operators. There are multiple ways some of these issues can be addressed, and the department follows up with targeted observations to review any strategies put in place.

As I mentioned, we continue to work on both the program and our reporting on the program, and will continue to utilise the information gained from IO observations in policy review and development of standards for the regulation of the industry.

4 March 2020: VALE raises concerns about repetitive issues on voyages

Analysing the Independent Observer (IO) reports closely, it is very obvious that particular vessels, or particular areas in certain vessels have issues that are noted repetitively. For example, MV Yangtze Fortune has had repeated reports of water infrastructure issues such as clip on domestic hose fittings dislodging or breaking with leaks, flooding and lack of water delivery in addition to troughs being easily displaced due to shape with the issue resulting in food and/or water deprivation and spillage. MV Ocean Drover has some drainage issues and has had these historically also. MV Gloucester Express has had exhaust fumes noted in some areas. MV Al Shuwaikh has significant heat issues in selected parts of the vessel as do many other vessels, usually in the areas closest to the engine room (eg Decks 4 and 5 on MV Greyman Express and Deck 4 on the MV Rahmeh (renamed Gulf Livestock 1)). In addition, other management issues sometimes get reported repeatedly eg pilot sheep on the MV Maysora reported on a number of occasions to be deprived of food and water.

VALE could compile a list of these repetitive issues from the IO reports 2018 and 2019 but as you know, the IO reports available in the public domain are summarised, sanitised and variable in quality and quantity of data provided (eg even basic information such as maximum and minimum dry bulb temperature (DBT) are not routinely provided and maximum wet bulb temperature rarely; 11/35 available IO summaries for voyages to China have no maximum DBT or humidity provided and 21/35 have no minimum DBT provided – an issue for northern winter China voyages). Any compilation we did would thus be incomplete and would fail to capture all available data. The Dept is far better placed to accurately analyse which decks or pens are an issue for each ship and also which ships are repetitively problematic. The fact that some stand out even on the scarce data available eg

the MV Yangtze Fortune is concerning and we believe all IO reports (original reports and summaries) from this vessel should be immediately analysed and forwarded to AMSA for assessment.

Until such time as a full audit is available, could we suggest that load plans are altered to avoid placing animals in any IO-documented areas of increased heat and humidity, poor ventilation or poor drainage for each vessel? This information should also be included as part of the routine HSRA and load planning for each vessel.

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**23 August 2018: VALE'S offer to Government rejected.**



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**11 April 2018: Letter to Minister David Littleproud re VALE offer of scientific veterinary assistance.**



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**3 April 2018: Letter to CVO Mark Schipp re Department Heat Stress Thresholds not being supported by scientific and field data.**



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**5 February 2018: Letter to CVO Mark Schipp re incorrect figures in High Mortality Voyage Report 65.** The investigation report was re-written to reflect correct figures but the figures were not changed in the Parliamentary report. Also below is the letter from Narelle Clegg that prompted our response.



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**7 February 2018: More FOI Docs obtained after querying their withholding HMV 68.**



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**6 December 2017: Letter to the Department seeking review of the decision to withhold two crucial reports under FOI re High Mortality Voyage 68**



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**23 November 2017: Response from the Department re FOI Request for High Mortality Voyage 68**



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**23 October 2017: Letter to Mark Schipp (DAFF) highlighting concerns about discrepancies in High Mortality Voyage Report 65.**



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## **CORRESPONDENCE PERTAINING TO HIGH MORTALITY VOYAGE 46**

(Chronological Order)

**May 2014: Freedom of Information Request regarding the July 2016 voyage of Emanuel Exports Pty Ltd with 4.35% sheep mortality (3027 Deaths).**



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**14 August 2014: Letter to DAFF and analysis of information In the public domain re High Mortality Voyage 46 (MV *Bader III*) in September 2013**



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Response from DAFF



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**14 December 2014: Follow-up letter to Dr Schipp with Addendum to initial analysis**



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**Subsequent email trail between VALE and Dr Schipp**

Summary: no response despite two requests; still nothing as at 14 April 2015



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**12 May 2015: Response from Dr Schipp**



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**24 December 2014: Letter from Phillip Glyde on behalf of Dr Grimes re ESCAS breaches in Gaza**



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**Minster for Agriculture acknowledges that he is aware of the evidence presented In a Federal Court to demonstrate routine overstocking on LE Voyages.**

22 January 2014: House of Representatives question for the Minister for Agriculture



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**6 March 2013 Questions on ASEL breaches: more unanswered correspondence**

To: Rebecca Irwin

Re: Dr Lynn Simpson's submission to DAFF

NOTE: this is not in chronological order as the Substitution of Vets correspondence (preceding and post-dating this request) was collated together



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**A SEQUENCE OF LETTERS AND CORRESPONDENCE TO AND FROM DAFF REGARDING THE SUBSTITUTION OF VETS FOR ACCREDITED STOCKPERSONS ON LIVE EXPORT VOYAGES AND CONTRAVENTION OF ASEL REQUIREMENTS FOR SUCH. IT'S TAKEN 12 MONTHS TO GET THE ADMISSION THAT IT HAPPENS – NOW TO SEE WHY THE EXPORTERS WEREN'T PENALISED FOR BREAKING THE LAW.**

(Reverse chronological order)

**16 April 2014**

From: Tim Naylor

Re: Further questions re lack of accredited stockperson, Port Kembla to Madagascar voyage

Possibly qualifies as a response ... though a blank piece of paper would serve equally well.



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**17 March 2014**

To: Jenny Cupit

Re: Further questions re lack of accredited stockperson, Port Kembla to Madagascar voyages



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**3 March 2014**

From: Jenny Cupit (DAFF)

Re: Further questions: Port Kembla to Madagascar voyage

DAFF explain their penalties are "outcome based" ie no penalty applied for breaking the law if no adverse outcome. Interesting. Would like to try that argument on a random breath test: "Yes officer Im drunk but I never caused a crash so you cant prosecute"!!!! And anyhow, when has a high mortality voyage NOT been an adverse outcome?



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**1 February 2014**

To: Rebecca Irwin (DAFF)

Re: Further questions: Port Kembla to Madagascar voyage

DAFF's misinformation about their licensing of the relevant exporter is pointed out and based on this, DAFF asked to explain the lack of penalties



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**12 December 2013**

To: VALE

From: Rebecca Irwin (DAFF)

An admission from DAFF that there had been voyages without stockpersons with reasons as to why no penalties applied: exporter no longer holds a licence (WRONG).

Still no answer to our original question though!



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**24 April 2013**

To: Jonathan Benyei (DAFF)

Re: Substitution of vets for accredited stockpersons on live export voyages

We ask again "How many occasions have exporters been allowed by your department to waive the requirement for a stockperson to be on board a live export ship, and on what legal basis has that waiver has been granted?"

We provide examples of suspected or known voyages that proceeded without a stockperson as requested by DAFF.



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**28 March 2013**

To: VALE

From: Jonathan Benyei (DAFF)



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**5 February 2013**

To: Rebecca Irwin (DAFF)

Re: Substitution of vets for accredited stockpersons on live export voyages



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**5 February 2013**

To: VALE

From: Rebecca Irwin (DAFF)



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**5 December 2012**

To: Rebecca Irwin (DAFF)

Re: Substitution of vets for accredited stockpersons on live export voyages



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## APPENDIX B: VALE ANALYSIS OF IO 197 REPORTS COMPARED TO DEPARTMENT OF AGRICULTURE'S IO SUMMARY

See: <https://www.vale.org.au/io-reports.html> Report 197

Draft IO Report	Final IO Report	IO Summary
<b>EXECUTIVE SUMMARY</b>		<b>VOYAGE SUMMARY</b>
There were cattle shipped that should have been rejected under ASEL eg SEALS cow with lumpy jaw, LSS heifer with an infected swollen hind fetlock on account of a missing claw hoof that resulted in non-weight bearing lameness and bulls from SEALS with bleeding horn buds due to horns being cut too short	The section about cattle not being fit to load under ASEL was removed from the executive summary and moved to Section 8f	<p>"The causes of these mortalities were not considered to be linked to any systemic failure by the exporter" –</p> <p>VALE COMMENT – loading cattle that are unfit to load and significant stockperson competency issues are directly the responsibility of the exporter</p> <p><b>HEALTH AND WELFARE</b></p> <p>"The observer noted that three cattle showed signs consistent with ASEL rejection criteria. Considering available information, an assessment of suitability of these animals was inconclusive."</p> <p>VALE COMMENT: there was 1 cow with lumpy jaw (non ASEL compliant), 1 cow with non weight-bearing lameness and a missing claw and bulls (plural) with bleeding horn buds (non ASEL compliant). There were also concerns raised about unsuitability of cull cows. The DAWR statement is incorrect and misleading as there are &gt;3 cattle and the cattle described have ASEL reject criteria.</p> <p>"These cattle had no observable negative health or welfare implications and were discharged in Jakarta"</p> <p>VALE COMMENT: non weight-bearing lameness is not fit to load in Australia and is a negative health and welfare situation. The wording is a) misleading and b) contrary to what the IO said</p>



Draft IO Report	Final IO Report	IO Summary
<b>EXECUTIVE SUMMARY</b>		<b>PEN CONDITIONS</b>
Areas became flooded with heavy effluent during discharge in Jakarta Port – challenging for crew and cattle standing in some pens with liquid eluent, fetlock deep for over 30 hours	Comment added that heat stress may have been a result of excess moisture from the effluent	Re the effluent on Decks 6 and 7: “No negative health or welfare implications were observed upon the cattle due to these pad conditions with affected animals discharging at this port  VALE COMMENT: this is not what the IO said. The IO said that “Heat stress may have been a result of excess moisture from the effluent”. This is a well known complication of wet bedding/wet conditions when combined with high ambient temperatures.
Cattle in some pens showed heat stress in Indonesian Ports		Heat stress is detailed under Ventilation consistent with this comment
Manure pads in some pens not washed and became heavy and sloppy	Comment added that these conditions did not appear to cause heat stress	“pad conditions in the main pens and hospital pens were managed acceptably throughout the voyage”  VALE COMMENT: an incorrect representation of the IO comments.
Most cattle had acceptable space, feed and water	Most cattle deleted and changed to “A general observation was”	“stocking density was within ASEL requirements”  VALE COMMENT: the IO did not make this comment

Draft IO Report	Final IO Report	IO Summary
<b>EXECUTIVE SUMMARY</b>	<b>EXEC SUMM</b>	<b>HEALTH AND WELFARE</b>
14 cattle died; The [redaction] were appropriately euthanised due to traumatic injuries. The [redaction] cattle died due to suspected stress related illnesses, all of which were SEALS cattle. [Redaction – likely a number] of 325 older cull cows died (ie [redaction] %) from the same SEALS consignment suggesting they were not fit to transport	<p>The word “appropriately” was deleted</p> <p>Changed to “what the stockman suspected as being respiratory...”</p> <p>Deleted “suggesting they were not fit to transport”</p>	<p>No mention that a redacted % of a consignment of older cull cows died.</p> <p>VALE COMMENT: why were older cull cows even included for feeder/slaughter?</p>
Issues were also identified with the management of sick and injured cattle by one of the SEALS stockmen. “This included insufficient supply of saw dust bedding in hospital pens, lack of care to downer cattle, incomplete and inaccurate record keeping on voyage reports, and delayed or insufficient euthanasia of cattle showing signs of pain and suffering and imminent death.”	Similar	<p>No mention of insufficient bedding, lack of care to downer cattle or delayed euthanasia.</p> <p>No mention in IO summary of the inaccurate record keeping or issues with S4 drugs.</p> <p>VALE COMMENT: Government summary excluded concerning and essential information recorded by the IO.</p>

Draft IO Report	Final IO Report	IO Summary
<b>EXECUTIVE SUMMARY</b>	<b>EXEC SUMM</b>	<b>HEALTH AND WELFARE</b>
Furthermore no records were made of veterinary medications used, despite evidence that Flunixin and Trisoprim used. At least two heifers administered with Schedule 4 veterinary drugs were not identified to show that a withholding period of 28 days should pass before slaughter. This is contrary to section 5.8 and 5.9 of ASEL and relevant to guidelines for responsible use of Schedule 4 veterinary drugs.	Similar	No mention in IO summary of the inaccurate record keeping or issues with S4 drugs.  VALE COMMENT: Government summary excluded concerning information recorded by the IO.
Further concerns for animal welfare include the discharge of two severely lame heifers that had non-weight bearing hind foot lameness injuries (one LSS and one SEALS) that were infected and had a poor prognosis for recovery.	Similar	No mention that one of the animals not fit to load was lame (with only one claw) thus should not have been loaded in Australia or discharged in Jakarta.  No comment about the animal welfare implications that another animal that also had non-weight bearing lameness was discharged in Jakarta.
Empty drug containers cast on the ground remaining until in deck washing	Similar	No mention in IO summary
In Jakarta port, the medical room containing all veterinary drugs was left unlocked during discharge	Similar	No mention in IO summary
Smoking also occurred throughout the livestock decks by many persons during discharge where cigarette butts were left in sawdusted areas	Similar	No mention in IO summary despite this being an extreme risk for animal welfare and on a vessel that had undergone a full investigation after a major fire in Fremantle Port with a full accident report stating fire preventative measures.

Draft IO Report	Final IO Report	IO Summary
<b>THE CONSIGNMENT</b>	<b>CONSIGNMENT</b>	
146 Friesian heifers transported	Similar	No mention of dairy heifers. VALE COMMENT: the public and animal welfare bodies assume only <i>Bos indicus</i> exports for feeder/slaughter from northern ports so this omission by the Dept is noteworthy
<b>THE VOYAGE</b>		<b>PEN CONDITIONS</b>
The forward section on deck 5 was not washed due to increasing daily cattle mortality and morbidity levels on that deck prior to washing. Wash down did not occur on decks 7,8, or 9 because they were the first to be discharged in Jakarta and the manure pad was deemed as acceptable by the stockmen	Similar	Deck 5 had no wash performed as the pad conditions were deemed adequate based upon an assessment made by the stockpersons.  VALE COMMENT: this is false and misleading. The reason Deck 5 was not washed was due to dead and dying cattle. Decks 7-9 were not washed because deemed adequate
A decision for deck washing was already decided by day three so the chief officer could plan the order for emptying water tanks to livestock and control the ships trim to facilitate effluent drainage during washing	Similar	No mention. VALE COMMENT: given the AMSA ship investigation findings of a number of vessels unable to drain regardless of trim. It would be important to assess whether the Ocean Drover is one of the vessels with this fault.
<b>Table 1 Morbidity and Mortality</b> Exporter redacted and it appears as if mortality numbers redacted as no "n" included	<b>Table 1 Morbidity and Mortality.</b> Exporter deleted and mortality number deleted. Added comment: "The Observer did not witness any post mortems, however one recorded in the daily report"	This detailed information was not presented in the IO Summary. It is interesting that that this seemingly diligent IO was not present for the post-mortem and made this comment as the comment could be taken to imply that the IO believed the post-mortem record on the daily report was incorrect. There is no clarification to determine whether this is a statement of fact (eg "I wasn't there") vs dubious record (eg "did it happen?" or "was this an incorrect record?").

Draft IO Report	Final IO Report	IO Summary
<b>THE VOYAGE</b>		<b>PERSONNEL</b>
Four of the five stockmen were easy to approach and always helpful to supply information as requested. One of the stockmen from SEALS however was not	This was altered to “most of the stockmen were easy to approach and always helpful”. Reference to the difficult stockman removed.	“Communications between all staff was generally easy going and professional during the voyage” VALE COMMENT: Despite extensive documentation of very concerning problems with one SEALS stockperson, this was not included in the personnel section. Wording was thus misleading to public.
<b>Documentation</b>		<b>LOADING</b>
The load plan was missing some information about deck identification correlating to total livestock numbers and numbers less than on load plan. There is a comment that this resulted in IO confusion	Comment re “This caused the IO some confusion as to total numbers of cattle per deck and exporter” was removed	No mention of the load- plan issues
<b>Loading</b>		<b>LOADING</b>
A potential hazard for livestock injury was identified during loading. Two sections intersected on the load ramp (port to ship) loosely fastened together with hay twine. Some cattle were hit by the flapping walls as they passed this intersection. After ship loading it was noted that three larger framed cattle had haematomas around the hip and thigh areas. It is conceivable these injuries occurred due to hits from the unsecured load ramp walls	Comment added: “This was an observation made retrospectively after reviewing the footage and photos. No discussion took place at the time”	“No animal welfare issues were observed during loading”  VALE COMMENT: This is in direct contradiction to the welfare issues noted in both the initial and final draft reports. Haematomas (ie bleeding/bruising) are an animal health and welfare issue
<b>Pen Construction</b>	<b>Pen construction</b>	<b>PEN CONDITIONS</b>
Several cattle pens had floor surfaces covered in metal gridding and other protrusions 2-3cm in height – identified as hazard for cattle	Comment added: “The Chief [Officer? Or DAWR?] was advised of the floor surfaces.	The observer identified sections of flooring were a potential welfare risk for the cattle.  VALE COMMENT: Actual details not provided

Draft IO Report	Final IO Report	IO Summary
<b>Pen Construction</b>	<b>Pen construction</b>	<b>PEN CONDITIONS</b>
A further hazard for cattle injury was identified in several pens where gates were left on the ground. Cattle were observed slipping on the gates. On deck 5 forward in a nearby hospital pen, a heifer that had been residing in a pen with a gate on the ground did have a major laceration to the hind coronet band. Stockman should remove fallen gates to avoid limb or hoof injury to cattle	The comment: "stockman should remove fallen gates...to cattle" was removed and replaced by "A crew member was advised of the gates however there was no change to the conditions of the pen".	Re stacked gates: "The observer noted cattle slipping on these gates. One heifer ....foot laceration. No other animals were noted to have negative health or welfare implications as a result of this issue.  VALE COMMENT: the phrase "No others animals.." has been added by DAWR and is potentially misleading as it is not in the draft or final report AND the number of cattle slipping is not detailed.....ie how many cattle were affected?
<b>Ventilation</b>		<b>VENTILATION</b>
The hottest area was 9 <sup>th</sup> Nov on deck 6, 30.6 WBT and cattle showed elevated respiration rates and oral drooling. Some dairy heifers on deck 7 showed heat stress (elevated respiration and oral drooling) whilst in Jakarta....the dairy heifers were given more space by opening gates and this appeared to alleviate heat stress...the heifers were the first to be discharged	Description of heat stress removed and replaced with "showed heat stress score of 2"...  Comment added after "given more space" – "by the stockpersons opening..."  Added after discharge: "This was coordinated by the Stockpersons	No description of the heat-stressed cattle on Deck 6. But score provided  Heat stress on Deck 7 mentioned with score given but no breed (dairy heifers) recorded
<b>Feed/Water/Pen Management</b>	<b>Feed/Water/Pen Mgmt</b>	<b>FEED AND WATER</b>
Water fill rates in many troughs were slow, water levels often not more than 5cm full in many troughs and several malfunctions observed where troughs were empty or leaked.	Comment added: "There was no identifiable significant welfare concerns as a result"	Described trough issues with a comment that no welfare concerns as a result. VALE: Did DAWR insist on this with IO clarifying as "identifiable" in Final Report or was this the IO observation?
Draft IO Report	Final IO Report	IO Summary
<b>Feed/Water/Pen Management</b>	<b>Feed/Water/Pen Mgmt</b>	<b>PEN CONDITIONS</b>

No evidence of sawdust in hospital pens managed by SEALS on decks 2 and 5	Changed to “No evidence of sawdust in hospital pens managed by SEALS on decks 2 and 5 which contained cattle.” IO or DAWR highlighting welfare issue	“pad conditions in the ..and hospital pens were managed acceptably throughout the voyage. DAWR has deleted reference to lack of sawdust in the hospital pens on two decks, which was of concern to the IO VALE COMMENT: it is of grave concern that sawdust bedding was not provided to hospitalised cattle and that this information was omitted from the IO Summary. This is an issue for animal welfare and should have been included in the IO Summary.
<b>Cattle management (Sick/injured/dead)</b>	<b>Cattle management (Sick/injured/dead)</b>	<b>HEALTH AND WELFARE</b>
<p>Incident on deck 5: downer cow trampled due to fear from crew noise. The stockman was notified but did not come to assist for a further 30 minutes and cow was further trampled...she was in a state of shock...ten hours before she was moved to the hospital pen. She remained severely tucked up and depressed during the rest of the voyage.</p> <p>..on the same day, a cow found dead in the pen where the stockman had been earlier.</p> <p>Three more cows died in that same pen..from suspected handling stress induced pneumonia</p>	<p>Similar</p> <p>Added: the section on reject cattle being loaded that was in the original executive summary</p> <p>“Three more” redacted. “from suspected stress handling pneumonia” removed</p>	<p>Not included in the IO Summary. There is a brief list of mortality number and causes of mortalities.</p> <p>VALE COMMENT: gravity of the health and welfare issues is omitted from the IO summary</p>

Draft IO Report	Final IO Report	IO Summary
<b>Cattle management (Sick/injured/dead)</b>	<b>Cattle management (Sick/injured/dead)</b>	<b>HEALTH AND WELFARE</b>
A recumbent cow in the hospital pen with depression, difficulty breathing and nasal/ocular discharge was not offered water and found dead in the same position as filmed 12 hours earlier. "Her position indicated a failed attempt to reach water – her back legs were underneath her body but splayed and her head and neck outstretched less than a meter from the water trough. To gain access to water she needed to place her head between the fence rails"	Added comment after "rails": "This pen only had one water trough and cattle were required to place their head between the railings to reach this trough. There was up to 10 head in this pen"	Not included in the IO Summary
[Redacted] cow found dead..not removed from the pen for >12 h. "This was not optimal managed as it had died in a position that reduced access of the other cattle to the feed/water troughs and created an injury risk for the other cattle tripping over it...There are also ethical concerns relevant the cohorts in forced proximity to the dead carcass for such duration".	Removed "This was not optimal management" and "There are also ethical concerns....duration"	Not included in the IO Summary
[Redacted] other cows placed in the hospital pen where they remained recumbent over several days and developed symptoms indicative that death was imminent ... difficulty breathing, sunken eyes, no reactivity to touch. IO alerted daily contact (DAWR?). The cattle died was were not euthanased	Removed: "and developed symptoms indicative that death was imminent"	Not included in the IO summary



Draft IO Report	Final IO Report	IO Summary
<b>Cattle management (Sick/injured/dead)</b>	<b>Cattle management ..</b>	<b>HEALTH AND WELFARE</b>
On the same deck ("5 forward") two other cattle (heifers) were placed in the hospital pen on account of lameness according to daily voyage reports. They developed unusual clinical signs ie arched back, splayed leg stance, outstretched neck, head down, dropping ears, severe listlessness, respiration rate >100 bpm and difficulty walking. Questions possible overdosing of medications and combination. Heifers did not improve and continued to show signs of pain and discomfort. IO concerned that the pain and suffering justified euthanasia especially as not appropriate for transport in Jakarta	<p>Changed to "5 forward- SEALS</p> <p>Removed comment: "It was suspected that they may have been overdosed as the clinical signs suggested toxicity related gut problems" and changed to "The clinical signs (as above) suggested toxicity related gut problems"</p> <p>Removed comment: Photos and films of the heifer's conditions were sent to the daily contact person, where concern was expressed that the level of pain and suffering would justify euthanasia.</p> <p>Removed comment "This was especially an issue as the anticipated level of further handling and long transport times in Jakarta were not considered appropriate to provide an environment conducive to recovery" and changed to "This was a concern for the Observer due to the anticipated level of further handling and long transport times in Jakarta"</p>	Not mentioned in the IO summary

Draft IO Report	Final IO Report	IO Summary
<b>Cattle management (Sick/injured/dead)</b>	<b>Cattle management ..</b>	<b>HEALTH AND WELFARE</b>
“Several concerns for the responsible use of Schedule 4 veterinary drugs were identified. There was no record of veterinary meds recorded in the daily voyage reports for SEALS despite evidence of used medical packages by the hospital pen (photos 29,30). ...Flunixin, Trisoprim and Dexaprin. As these are considered Schedule 4 drugs, a withholding period before slaughter would have been necessary (of 28 days) yet no cattle in the sick pen were identified with ear tags to indicate they had been medicated”	Entire paragraph removed.	Not mentioned in the IO Summary
On Nov 6 <sup>th</sup> another SEALS heifer was noticed in the hospital pen as having a deep gash to coronet band and showing signs of pain and discomfort. Wound covered in dirt, no cleaning, treating with topical ointment. Heifer was unable to bear weight on the injured foot even up to the day of discharge. Voyage reports also showed no record of entry for this lame heifer or if she was treated with medication	Unchanged	Not mentioned in the IO Summary
On the 8 <sup>th</sup> November ..a SEALS steer, also under the management of [redacted] was identified with extremely swollen knee and fetlock joints and in acute pain. It was not placed in a hospital pen and there were no records in daily voyage reports of this steer being lame until 2-3 days later when it was “apparently” euthanised	Removed “also under the management of [redacted] Added re acute pain “these were vocalisations, eyes rolled back, head tilted backwards and lying down” Removed “apparently”	Not mentioned in the IO Summary
Draft IO Report	Final IO Report	IO Summary
<b>Cattle management (Sick/injured/dead)</b>	<b>Cattle management ..</b>	<b>HEALTH AND WELFARE</b>
[Redacted -number most likely] of 325 SEALS cows died and a further three showed continued	[Redacted] (above mentioned) of 325 SEALS cows...	Not mentioned in the IO summary.

<p>signs of illness at discharge. This [redacted] mortality and 3.4% morbidity was an animal welfare concern. Given that the cows were [Redacted] according to brand marks (and had a nervous disposition, indicating a possible lack of exposure to previous handling conditions pre-shipment their tolerance for coping with the ship stressed was low....perhaps compromised their immune system, causing many to succumb to pneumonia. This indicates a deficiency by the exporter in appropriate selection of cattle fit to export</p>	<p>(above mentioned added)</p> <p>Removed "their tolerance.....fit for export"</p> <p>Removed "their tolerance for coping with the ship stressed was low....perhaps compromised their immune system, causing may to succumb to pneumonia. This indicates a deficiency by the exporter in appropriate selection of cattle fit to export"</p>	
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Draft IO Report	Final IO Report	IO Summary
Deck conditions	Deck conditions	PEN CONDITIONS
<p>Day 7 described</p> <p>During discharge in Jakarta alleyways filled with effluent, aisle pens with cattle on decks 6 and 7 aft became completely waterlogged, challenging conditions for livestock crew as up to 20cm deep in places. On deck 6 aft on 9<sup>th</sup> Nov water leaking out of a major scupper pipe and from several troughs... Contravention of Sections 6.2 of MO: fluids should be kept clear of pens and associated work and access spaces</p>	<p>Comment added to Day 7 “See photos in mics section of media supplied</p> <p>Removed : “on the 9<sup>th</sup> November in Jakarta port”</p> <p>Shortened explanation of chief officer.</p>	<p>Re the effluent on Decks 6 and 7 – states 30cm deep not 20cm deep. “No negative health or welfare implications were observed upon the cattle due to these pad conditions with affected animals discharging at this port</p> <p>VALE COMMENT: DAWR mistake re depth of effluent. There was misreporting of the situation to a more favourable welfare situation. The IO actually wrote that “Heat stress may have been a result of excess moisture from the effluent” ie there was a negative welfare outcome and that it was not conducive to acceptable animal welfare.</p> <p>Summary states that IO couldn’t ascertain a cause but this does not appear in the reports (there is no comment about cause). No mention of AMSA or MO 43 despite contravention of MO 43.</p>
<p>Section 6.5 of MO states that trainer plates should be placed over drains in passageways to avoid causing injury but in Jakarta several drain openings left uncovered. In some places, these open drainage holes became submerged with effluent and were obscured; plastic gird covering placed over one 2sq m hatch without any rigid undersupport – risk for people.</p>	<p>Similar</p>	<p>No mention in IO summary</p>
<p>Despite signs stating no smoking was permitted throughout the decks, Indonesian port crew were observed frequently smoking throughout decks and butting cigarettes I sawdust – obvious fire risk</p>	<p>Similar</p>	<p>No mention in IO Summary</p>

Draft IO Report	Final IO Report	IO Summary
<b>Discharge</b>	<b>Discharge</b>	<b>DISCHARGE</b>
Panjang handlers good. Jakarta – indiscriminate use of electric prods on face and body and used on cattle that went down on the ships unload ramp and were trampled or collided with cattle moving the opposite direction	Comment: added “inside the ship and on the ramp” after “use of electric prods on both face and body”	Details not provided in IO summary: the observer witnessed non-compliant handling. This matter has been investigated and outcome purportedly available on department website. However, the Dept website has no record of a report from an Oct 2019 voyage: See <a href="https://www.agriculture.gov.au/export/controlled-goods/live-animals/livestock/regulatory-framework/compliance-investigations/investigations-regulatory-compliance#2020">https://www.agriculture.gov.au/export/controlled-goods/live-animals/livestock/regulatory-framework/compliance-investigations/investigations-regulatory-compliance#2020</a>
Several hazards for causing injury at discharge including a piece of wood loosely fixed at the bottom of the load ramp where cattle hit their hip and a piece of wire across the path of cattle just before entering trucks. There were also up to 15 people at any one time standing on ramp and caused discharging cattle to stop and consequently receive electric proddings.		Details not provided in IO summary
In Panjang shadow and plastic green sack caused cattle to balk and then jump over it where many slipped heavily afterwards. The IO suggested to the port crew to lay more sawdust over the ramp and this improved the general flow of cattle. Cattle were also observed slipping over heavily on an unstructured metal platform floor surface where they turned 90-degrees to enter the trucks. The floor was so slick that sawdust had little effect in adding traction	Removed: The IO suggested to the port crew to lay more .....sawdust had little effect in adding traction  Added: “potentially filled with sand and used as a weight after “a plastic green sack”	No mention in IO summary

Draft IO Report	Final IO Report	IO Summary
<b>Discharge</b>	<b>Discharge</b>	<b>DISCHARGE</b>
Once cattle were loaded into trucks, many were observed getting their head or horns stuck in nets that were fixed over the truck..in several cases began to choke; some trucks had rods to lift the nets which reduced the risk.	Removed	No mention in IO Summary
The incidents observed at discharge indicated that ESCAS inspectors were not present or that discharge was being ineffectively monitored	Removed	No mention in IO Summary
<b>Summarised Animal Welfare Issues</b>		
included cattle unfit to load, discharging animals not fit for transport, inadequate care of sick and lame cattle by a SEALS stockperson and delayed euthanasias despite hopeless Px	Removed this whole section	Not included in IO Summary
<b>Conclusions</b>		
Cattle in some pens were standing in liquid effluent for over 30hours, a situation not conducive to acceptable animal welfare. Some cattle in these areas also showed elevated panting scores indicative of heat stress.	Removed: "a situation not conducive to acceptable animal welfare"	No mention of heat stress in association with the effluent

Draft IO Report	Final IO Report	IO Summary
<b>Conclusions</b>	<b>Conclusions</b>	
Sick cattle in hospital pens lacked saw dust despite it being abundantly available, recumbent animals were not given adequate access to water and 10 acutely sick cattle despite showing poor prognosis for recovery and imminent death were not promptly euthanised in consideration for their welfare. No records in the Daily Voyage Reports were made for the Schedule 4 Veterinary medications used on sick or injured cattle. Furthermore [redacted] cull cows that died due to stress related illnesses, suggested that they were not fit to transport. Furthermore, the captive bolt stunner was left unattended by the SEALS stockman over several days on deck.	Similar	No mention in IO summary
Poor effluent drainage capabilities of the ship while in port, caused challenging conditions for livestock crew to work during feeding routines. It also contributed to sloppy manure pads and cases where cattle showed visible signs of heat stress.	Similar	No mention of challenging conditions for crew.  No mention that it contributed to heat stress.

<b>Parameter</b>	<b>Dog</b>	<b>Sheep</b>
Fear structure	Predator	Prey
Evolved for exercise	Yes	No
Enjoy exercise	Yes (unless diseased)	No – energy conserved for foraging and predator evasion. Only young lambs will play and exercise
Mouth anatomy	Carnivore evolved for ease of wide mouth opening to grasp and devour prey	Herbivore. Anatomy not suited to sustained open mouth position.
Panting as a heat loss mechanism	Yes. Highly evolved in dogs due to their exercise capabilities and reflected in their anatomic structure including how wide the canine mouth can open	Yes. A mechanism for survival with limited anatomic ability to open mouth wide.
Panting a sign of weakness	No	Yes. Display of open mouth panting can signal a weaker individual when prey assessing a flock
Digestion possible when open mouth panting	Yes. Monogastric	No. Rumination requires closed mouth chewing of cud.
Open mouth panting as a positive welfare state	Yes, occurs with excitement, pleasure etc	No
Open mouth panting as a negative welfare state	Yes. Incessant open mouth panting is one of the factors contributing to negative Quality of Life Scores in canine Cushing's syndrome. Open mouth panting also occurs with fear and pain.	Always.

Open mouth panting in nearly all species other than dogs would only occur as a response to extreme physiologic conditions (exertion or heat) or pathologic conditions. In dogs, panting must always be assessed in conjunction with other behavioural observations: body posture, head posture and tail posture and movement.

It is notable that the Department of Agriculture does not compare sheep with cats, another common domestic species. In cats, open mouth panting is nearly always an adverse welfare state (fear, pain, heat catecholamine excessive states such as hyperthyroidism) and cats can die with nasopharyngeal obstruction before they relieve respiratory difficulties by open mouth breathing. Hunting/play drive in this predator species occasionally overrides aversion to open-mouth panting in younger animals.



## Review

# Two Domains to Five: Advancing Veterinary Duty of Care to Fulfil Public Expectations of Animal Welfare Expertise

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**Simple Summary:** Veterinarians are animal health experts. More recently, explicit references to veterinarians as animal welfare experts have proliferated. Veterinarians are ideally situated to act as animal welfare experts by virtue of their core work with animals, influence over owners, their roles in policy development, compliance, and monitoring, and as educators of future veterinary professionals. However, the discipline of animal welfare science has moved beyond a focus on nutrition and health towards an acceptance that the mental experiences of animals are the focus of welfare consideration. The Five Domains Model is a framework for assessing animal welfare and focuses on mental experiences arising from a broad range of impacts or opportunities. The Model can be used as a framework to integrate contemporary understanding of animal welfare science in veterinary curricula and improve welfare literacy within the veterinary profession.

**Abstract:** Veterinarians are animal health experts. More recently, they have been conferred a leading role as experts in animal welfare. This expectation of veterinarians as welfare experts appears to stem from their training in veterinary medicine as well as professional contributions to welfare-relevant policy and law. Veterinarians are ideally situated to act as animal welfare experts by virtue of their core work with animals and potential influence over owners, their roles in policy development, compliance, and monitoring, and as educators of future veterinarians. However, since its inception as a discipline over 70 years ago, animal welfare science has moved beyond a two-dimensional focus on nutrition and health (biological functioning) towards an understanding that the mental experiences of animals are the focus of welfare consideration. The Five Domains Model is a structured and systematic framework for more holistically considering conditions that contribute to the animal's internal state and its perception of its external situation, and the resultant mental experiences. The Model can be used to better align veterinary animal welfare expertise with contemporary understanding of animal welfare science and improve welfare literacy within the veterinary profession. Improved understanding of animal welfare science is likely to lead to increased confidence, competence, and empowerment to act as experts in their daily lives.

**Keywords:** Five Domains Model; animal welfare science; welfare enhancement; veterinary education; continued professional development; veterinarian; animal welfare; quality of life



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## 1. Introduction

As a result of their training, veterinarians hold primary authority and responsibility for animal health [1]. As an example, the World Organization for Animal Health (OIE) delegates the responsibility of implementing animal health and welfare measures to veterinarians in each member country; veterinarians are the only professionals designated 'Competent Authority' in the OIE's Terrestrial and Aquatic Animal Health Codes [2,3]. Veterinarians are also called upon for expert commentary and knowledge of animal health during disease outbreaks e.g., [4,5] and are the first port of call for the treatment of sick or injured animals [6,7].

By virtue of their role as animal health experts, veterinarians have also implicitly been conferred primary expertise in safeguarding animal welfare more generally [2,3,6,7]. This view of veterinarians as the predominant animal welfare experts appears to stem from their training in veterinary medicine, as well as professional expectations outlined in national and international strategies and laws (e.g., [1,8]), and by veterinary regulatory bodies e.g., [9,10]. For example, part of the OIE's approach to improving animal welfare globally is to provide guidance " . . . to Member Countries in order to strengthen their Veterinary Services to enhance their capacity to implement animal welfare standards" [8]. Added to this, the New Zealand Code of Professional Conduct for Veterinarians expressly mentions that "Veterinarians have a special duty to protect animal welfare and alleviate animal suffering" [9]. The result of these increasingly common explicit references is that veterinarians are now often regarded as experts in animal welfare in many contexts and have special legal and professional obligations [9,11–13]. In addition to these obligations, veterinarians have a 'duty of care' to the animals under their care [14–16]. This duty extends to their clients, as the owners of the animals they care for. In a broader sense, veterinarians, as professionals are held to account by the wider public. There is an expectation that veterinarians will act professionally and use their skills for the benefit of both animals and people [9,10,14].

While veterinarians are ideally placed to safeguard animal welfare, understanding of animal welfare, the ways of scientifically assessing welfare states, and expectations for animals' welfare have changed significantly over the last five or six decades [17–22]. This evolution of animal welfare as a scientific discipline in its own right has resulted from advances in veterinary, medical, behavioural, psychological, neurological, cognitive, and animal sciences [20,23]. The result is that animal welfare is now characterised more broadly and includes consideration of the mental experiences of animals, that is, how they experience their situation and life [17–22]. Health and nutrition, the historical focuses of veterinary training, represent only two of the domains that are considered in a holistic appreciation of an animal's welfare state [17–22]. In addition, there is a growing expectation that, to provide animals with good welfare, we must ensure that they have a wide variety of positive experiences, rather than simply eliminating negative experiences [17–22,24]. These changes in knowledge and expectations have led to greater expectations of veterinarians to safeguard and enhance animal welfare in broader ways.

This review explores the expanding role of veterinarians in protection and promotion of animal welfare. We begin with a brief history of the role and the ways in which veterinary science has contributed to advances in animal welfare science thinking. We then discuss how the traditional focuses of veterinary medicine, that is, health and nutrition, are now considered to be components of more holistic science-based understanding and assessment of animals' welfare states. Finally, we make recommendations for how the veterinary profession can advance their implicit and explicit duty of care and take steps towards fulfilling their role as experts in animal welfare by embracing these animal welfare advancements to a greater extent in both training and professional practice. The scope of this review is limited to consideration of how contemporary animal welfare science (i.e., use of scientific methods to understand and assess the capacity of animals for, and elicitation of, mental experiences relevant to welfare) can be taught to, and used by, veterinarians. This is not to diminish the importance of training in related topics such as animal ethics, policy, and law for veterinarians, but instead aims to focus the reader's attention on the potential for veterinarians to apply their scientific knowledge more broadly. Throughout, examples will be presented from a New Zealand context.

## **2. Advances in Scientific Understanding of Animal Welfare Have Changed the Way Welfare Is Characterised and Assessed Leading to Changes in Expectations for the Welfare of Animals under Human Care**

The term 'animal welfare' is used to describe both an academic discipline and a feature of sentient animals. Animal welfare is a complex and multi-faceted subject that has scientific, ethical, economic, cultural, religious, political, and legal dimensions [8,17–22,25]. In addition, animal welfare is now generally considered to refer to the subjective state of

an animal, as perceived by the animal itself, and is a representation of its overall mental experiences [24–27]. Quality of life is conceptualised as the animal's welfare state (i.e., overall mental experiences) over a longer timeframe [27]. As we now consider the welfare of animals over time, quality of life and animal welfare have become synonymous terms [20,27]. Sentience is the capacity to have negative and positive mental experiences and is a feature of those animals about whose welfare veterinarians and welfare scientists are generally concerned [25,28]. In most jurisdictions, animals assumed to be sentient include all vertebrates and a few neurally and behaviourally complex invertebrate taxa e.g., [1,29] (Box 1).

**Box 1.** Sentience in legislation.

In 2015, The New Zealand Government amended the Animal Welfare Act 1999 to include explicit recognition of animal sentience [1]. This inclusion achieved two things for animal welfare in New Zealand: (1) it acknowledged that animals (as defined in the Act) have the capacity to experience positive and negative mental states; and (2) this acknowledgement resulted in the affective state orientation to understanding animal welfare being explicitly recognised by New Zealand law.

As a discipline, animal welfare science is inextricably linked to animal ethics and legislation by virtue of its foundation. In the 1950s and 1960s, ethical questions were raised about how animals were being treated in factory farming situations because of growing public awareness of such treatment [30–32]. As a result of a 1965 United Kingdom government report, recommendations were made for increased research in various scientific disciplines to improve our understanding of farmed animal's needs [18,19,25]. From this beginning, interest in the welfare of animals has broadened to include animals in a range of contexts (e.g., wild animals in captivity, animals in research, companion animals), resulting in the evolution of a separate scientific discipline known as animal welfare science [18,19,25].

Veterinary and various animal sciences are amongst the many disciplines that have contributed to improving our understanding of animals' needs [18]. The work done in the mid- to late- 1900s improved our understanding of, and ability to identify, prevent, treat, optimise, or otherwise manage aspects of animal nutrition, health, disease, and dysfunction, alongside increasing productivity in farmed animals. Therefore, one of the first roles of veterinarians in relation to animal welfare was as researchers providing the knowledge that would later be used to improve the lives of animals [18,19,25].

Veterinarians were positioned as animal welfare experts by virtue of their clinical role as animal health experts [33–36]. There was support for this view from the predominant orientation to understanding and assessing animal welfare at that time, that is, 'biological functioning' [18,19,37]. Proponents of this orientation put emphasis on the biological function or physical health of the animal when assessing welfare states. According to this orientation, 'good' animal welfare is considered to occur when the animal has good health, productivity, reproduction, and other such metrics of physical function [18,19].

During the 1970s and 1980s, this orientation to animal welfare was generally considered sufficient to assess the welfare status of animals. For animals in many situations, meeting their basic ('survival-critical') needs was not as easy as it is with today's knowledge and technology [18,19]. Therefore, health and productivity were appropriate metrics for welfare when the overall welfare status of animals was poorer. However, with advances in scientific knowledge about animals' biology and behavioural needs and their neurological and cognitive capabilities, came advances in our understanding of animal welfare. The now-dominant, 'affective state orientation' facilitates an understanding of animal welfare beyond biological functioning [17–19,25].

## 2.1. Extending the Focus of Animal Welfare to Include Consideration of Affective State

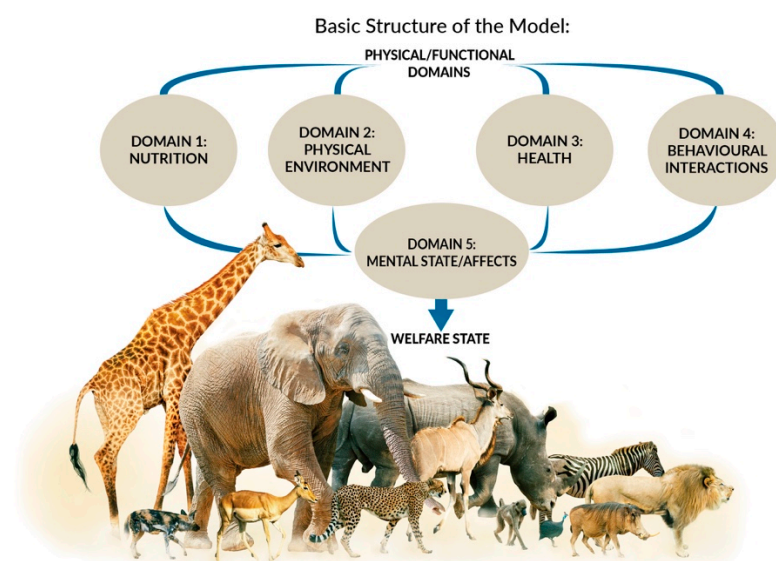
According to the affective state orientation, 'good' welfare exists when an animal experiences an overall positive mental (affective) state [18,19]. Affective states are mental experi-

ences that have valence (i.e., are experienced as positive/pleasant or negative/unpleasant) and thus have significance to the animal [28,38]. That significance is proposed to confer a fitness advantage for sentient animals by motivating responses, both immediately and in the future, that protect the animal from harm (for negative experiences) or encourage it to engage with beneficial circumstances (for positives) [28,38]. Affective experiences arise due to neural processing of sensory information about the internal state of the animal (i.e., features of its health and physical function) but also reflecting its perception of its external environment [17]. In this regard, the affective state orientation integrates the biological functioning orientation in that physical state and mental state are dynamically inter-related.

With this new understanding it has become clear that, in some cases, animals can be healthy and productive but have poor welfare nonetheless and that evaluating physical state/biological function alone does not provide a holistic understanding of animal welfare. Nor can that approach alone facilitate what is now generally considered to be ‘good’ welfare. For example, in some cases, selective breeding of farm animals for productivity can result in a decline in an animal’s overall welfare status despite its physical state being apparently good.

## 2.2. The Five Domains Model for Assessing Animal Welfare Facilitates More Holistic Evaluation of Welfare States Including Positive Experiences

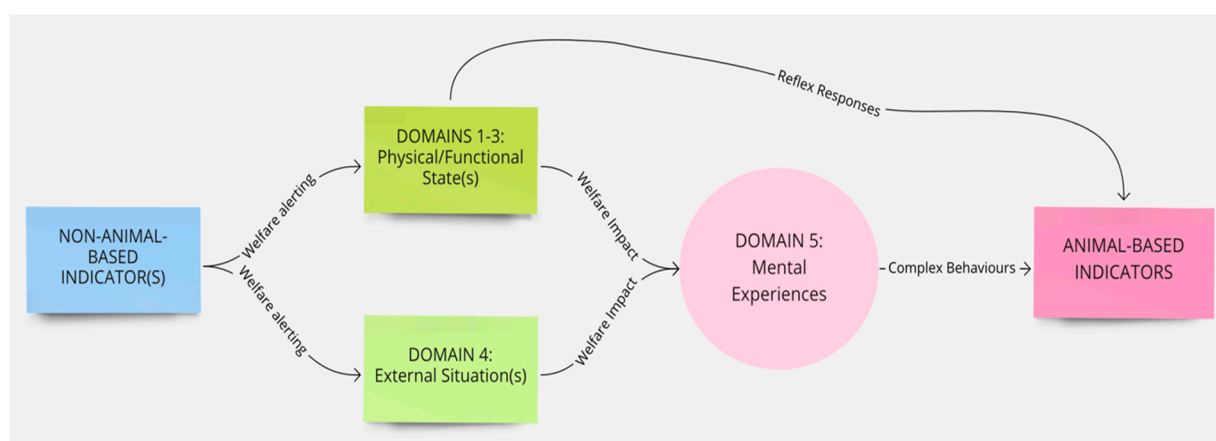
As noted, animal welfare is now understood as the integrated mental experiences animals have as the result of their perception of their internal state and external situation [24–27]. The Five Domains Model (Figure 1) reflects this understanding and facilitates more holistic assessment of animal welfare states [17,37]. The Model is only one example of a framework that uses this approach to animal welfare assessment, but it has numerous advantages for the purposes of teaching and clinical practice. The Model encourages consideration of conditions that contribute to both the animal’s internal state and external situation, and the resultant mental experiences. The structure is based on evidence from neurophysiology, animal behaviour, veterinary and animal sciences, and other allied disciplines [17,21]. The Model comprises four physical/functional domains and a fifth, mental domain. Within the physical/functional domains, there are three internally driven ‘survival-related’ domains: Nutrition (food and hydration status), Physical Environment (e.g., thermal, noise, and space), and Health (disease, injury, and functional status). The fourth domain, Behavioural Interactions, represents the animal’s perceptions of aspects of its external situation, particularly its social environment [17].



**Figure 1.** The 2020 Five Domains Model adapted by Cristina Wilkins from (Mellor et al. [17]).

Survival-related conditions are mainly aligned to our understanding of an animal's basic biological functioning (e.g., food, shelter, and health). In contrast, behaviours resulting from the animal's perception of its external situation can be interpreted with reference to behaviours expressed in natural environments or in situations where agency is promoted [17–19]. Agency refers to the animal's engagement in voluntary, goal-directed behaviour; the ability to exercise agency results in 'positive affective engagement' when animals are given 'freedom of choice' [21,39]. Finally, by including the fifth Mental State domain to evaluate the experiences an animal may have because of the conditions in the four physical/functional domains, the Model explicitly focuses the user's attention on the affective state orientation to animal welfare [17–19].

Importantly, we are unable to directly measure an animal's mental state, therefore, we rely on indirect assessments of mental experiences in Domain 5, i.e., inference based on observable/measurable indicators. Such inferences of mental experiences in non-human animals must be made with care [21,40,41]. Observable or measurable indicators of physical states and their relationships to the animal's conditions or management and their proposed mental states need to be scientifically validated to avoid claims of anthropomorphism [41]. Briefly, animal-based (AB) indicators are preferred because, as output measures, they more directly reflect an animal's likely mental experience [41] (Figure 2). However, in many cases non-animal-based indicators (NAB i.e., resource-based, and management-based) are acceptable because the link between these conditions and the animal's physical state has unequivocally been demonstrated [41]. For example, prolonged absence of drinking water can be used to infer dehydration and thirst in species that need to drink regularly. Likewise, for some species and situations, there is detailed understanding of the neurological mechanism for generating a specific mental experience (e.g., thirst, pain, hunger, breathlessness) which is known to motivate or accompany an appropriate observable behavioural and/or physiological response [41]. For example, lack of water (NAB indicator) and the mental experience of thirst might motivate water-seeking behaviour (AB indicator). This link is more difficult to establish for situation-related mental experiences arising due to the animal's perception of its environment because less of the underlying research for validating indicators and these linkages in Domain 4 has been done. Most of the AB indicators used in this domain are behaviours (Figure 2).



**Figure 2.** The logical link between physical/functional states can be used to validate animal welfare assessments using observable or measurable objective indicators applied to each of the first three physical/functional domains and their relationship to proposed mental experiences in Domain 5. Observable and measurable evidence of impacts and benefits is collated in Domains 1 to 4 and used to infer mental experiences in Domain 5. Validation of the link between situation-related experiences arising due to the animal's perception of its external situation (Domain 4) is more challenging than for the link between physical/functional states (Domains 1 to 3) and proposed mental experiences.

Advancements in our knowledge of animal welfare have allowed for such nuanced understanding about how physical/functional states (e.g., provision of adequate nutrition)



can impact upon the mental experiences (e.g., satiety or hunger) of animals and therefore their overall welfare status. These advances have also allowed for an understanding of how situation-related conditions may impede animals' ability to express strongly motivated behaviours or achieve important goals, i.e., their agency (e.g., barren environments) and result in negative welfare states (e.g., frustration or boredom) despite being in satisfactory physical condition.

### 3. Veterinarians Are Ideally Placed to Advance Animal Welfare in a Range of Contexts

Veterinarians are ideally placed to advance animal welfare in a range of contexts (Table 1) [12,13,37,42]. This potential results from their knowledge and training in veterinary science, their access to animals and their carers in a range of different contexts, their expert contributions to policy and law relating to animals and the public's trust in them because of their status as medical professionals [9,10,14,43–46].

**Table 1.** The range of contexts in which veterinarians are ideally placed to advance animal welfare and examples of the roles they do or could play in each context. Welfare protection refers to preventing or alleviating negative states; Welfare enhancement refers to promoting positive experiences.

Context	Role(s) of Veterinarians
Clinical work	<i>Welfare protection:</i> assessing, maintaining, and treating the physical state of animals under their care <i>Welfare enhancement:</i> encouraging opportunities for animals to engage in behaviours that they find rewarding by influencing and educating people in charge of animals
Expert advice	<i>Policy &amp; law:</i> government and industry consult veterinarians for expert advice on new or updated laws and policies that impact animals e.g., Codes of Welfare <i>Media:</i> expert commentary on animal-focused stories <i>Legal cases:</i> of animal abuse or neglect
Compliance & monitoring	<i>Monitoring:</i> animal welfare verification at slaughter premises <i>Compliance &amp; monitoring:</i> at rodeo and racing events, and for animals used in research, testing, and teaching
Tertiary education	<i>Training:</i> educating next generation of veterinary professionals

The combination of veterinarians being considered trusted professionals and their roles in society results in them being in situations of influence over animal welfare. Clinical veterinarians are responsible for the health and wellbeing of the animals under their care. This role is dictated as much by their training as by statements to this effect in Codes of Professional Conduct (e.g., [9,10]). Clinicians spend much of their day navigating interactions with their clients [14]. These interactions include recommendations about how animals are managed in a way that has the potential to improve their welfare. In this respect, veterinarians are welfare educators and information providers. Clinical veterinarians contribute towards protecting animal welfare (preventing or alleviating negative experiences) and have the potential to enhance the welfare of the animals under their care (promoting positive experiences).

As well as their primary role as clinicians, veterinarians work in a wide range of other fields and roles and thus have significant influence on animal welfare. For example, in many jurisdictions, veterinarians are employed as monitoring and compliance officers in slaughter premises where their role is to ensure animal products meet standards for the domestic market and those of export countries [42,47]. This involves verification of animal welfare and food safety requirements and certifying products for export [42]. They are animal welfare officers at research institutes and ensure research, teaching, and testing using animals is carried out in an ethical way [1]. They work for governmental bodies and are given special powers of authority in this role. As animal welfare inspectors, they may obtain and execute search warrants [1,48].

Importantly, veterinarians contribute, through their roles in government departments, to crafting or revising the very laws and standards that regulate our interactions with animals. Others are called upon to provide expert input to these processes, both nationally and internationally [2,3,49]. In addition, veterinarians are often called upon to act as expert witnesses in legal cases involving animal cruelty or neglect [50].

These specialized roles illustrate just some of the ways in which veterinarians are fulfilling their role as animal welfare experts beyond the scope of clinical expertise. Veterinarians are also employed as educators to train the next generation of veterinarians, veterinary paraprofessionals (e.g., veterinary nurses and animal scientists), and animal scientists. In this role, they are uniquely positioned to advance the expertise of future veterinarians in animal welfare.

Overall, veterinarians have roles in protecting animal welfare dictated by legal and professional obligations, by a duty of care for animals and their clients, and by society in general (Table 1). These roles place veterinarians in positions of responsibility and authority when it comes to animal welfare. Therefore, there are expectations that veterinarians are competent and confident to act as animal welfare experts.

#### 4. Training to Improve Animal Welfare Literacy within the Veterinary Profession

The OIE Global Animal Welfare Strategy “... supports the inclusion of animal welfare in curricula for veterinarians, veterinary paraprofessionals and students of animal agriculture and schools when relevant” [8] To fulfil expectations of animal welfare expertise, veterinarians need to be knowledgeable, competent, and confident in their own skills and abilities [51,52].

As a result of the advancements in our understanding of animal welfare, expectations have changed for veterinarians. Animal welfare is no longer limited to considerations of biological functioning and animal health [18,19,25,33–37]. There is now an opportunity for veterinarians to engage more widely with animal welfare science and expand their focus to consider the mental experiences of animals arising from conditions in multiple domains [17,33–35].

In this next section, we discuss how the necessary skills and knowledge, that is competency, to assess animal welfare can be achieved through veterinary training initiatives. We first describe the current situation regarding veterinary training in animal welfare science, using the New Zealand veterinary science curriculum to illustrate, before moving on to discuss how veterinary curricula could be flipped to prioritise animal welfare science training and improve animal welfare literacy in Section 5.

##### 4.1. Current Approach to Animal Welfare Science Training in Veterinary Curricula and Possible Consequences

In its current form, veterinary training is chiefly aimed at developing professionals with competencies in clinical sciences including pathology, pharmacology, diagnostics, and therapeutics. Because of this clinical focus, animal welfare science has thus far been presented as an isolated subject in most veterinary curricula [37,53]. In many programmes, welfare tends to be presented as a stand-alone subject in the earlier or pre-clinical years, either within or separate to other pre-clinical courses such as anatomy and physiology. As this is often the first exposure students have to the science of animal welfare, the teaching content is necessarily broad and theoretical and often taught as part of broader presentation of welfare-related topics like animal ethics, law, and behaviour [53,54]. In part, this may be because it is difficult to apply animal welfare science concepts to clinical examples when students do not have the necessary grounding in other related scientific disciplines. For example, they may not be able to extrapolate the welfare implications of delaying euthanasia of a terminally ill patient without understanding the pathophysiology of the disease, which is taught in later years [55,56].

By focusing animal welfare science teaching at only one (pre-clinical) location in veterinary training, and without any clinical context, students do not benefit from an integrated understanding of how they can apply animal welfare in practice. In our own experience, students taught welfare-related topics in first year fail to retain that understanding to

the end of the degree and enter clinical practice with less welfare-literacy than would be desired. The failure to integrate and reinforce welfare as a key aspect of veterinary medical practice throughout the degree may implicitly communicate to students that it is of lesser importance than other, more clinical subjects, a perception that may be carried into professional practice. Thus, there is a need to integrate welfare science into every aspect of veterinary training or, in fact, to situate veterinary science within a broader fundamental understanding of welfare science.

#### 4.1.1. Pre-Clinical Teaching

The pre-clinical years of a veterinary degree aim to provide students with basic knowledge and skills in a range of core disciplines [37,53]. Students learn the normal structure and function of a range of animal species and are introduced to animal handling and animal needs in early animal welfare and behaviour subjects. There may also be disciplines such as biochemistry and farm systems taught in these early years.

At this stage, animal welfare is taught as a basic science and mostly with a theoretical focus. This is appropriate for the level, often low, of prior knowledge students have in the discipline. Students first need to know what animal welfare is, how it is understood and what it means for them, how it can be assessed, and basic features of animal use and husbandry procedures, for example, humane slaughter and pain management [37].

In our New Zealand context, the disciplines relating to animal welfare science align with a basic understanding of Domains 1 (Nutrition) and 2 (Physical Environment) with some understanding of normal animal behaviour aligning with Domain 4. Students are also introduced to some of the affective experiences (Domain 5) animals may have arising from these domains for example, pain, discomfort, hunger, and thirst.

#### 4.1.2. Para-Clinical Teaching

After learning the basics of veterinary science, students move on to consider pathology and pharmacology. In pathology, students are taught the causes and effects of disease processes. They build on their prior knowledge of normal anatomy and physiology to understand animal diseases [57]. Pharmacology is also introduced at this point, and students learn how drugs work on body systems and their impact on disease processes.

There is some overlap between clinical and paraclinical teaching. In the paraclinical, and sometimes preclinical, years students are taught about the treatment of a limited number of animal species and how to handle clinical cases from presentation through to diagnosis and treatment. They may have some exposure to cases in clinics, but much of the teaching at this stage is via lectures or case-studies.

This would be an excellent location for animal welfare science education to continue. It could be used to help students understand the impacts of disease processes and therapeutics on the overall welfare of the animals under their care. The established links between physical/functional states and likely mental experiences of the animal can be aligned to welfare indicators and then serve as useful revision of physiological control systems. Animal welfare science could be used to cement student knowledge and apply what they are learning to the whole animal. For example, students could explore the impact of anti-emetics used to treat the unpleasant experience of nausea associated with renal disease. This therapy could have positive impacts in both the nutritional (e.g., improving animal feed intake), health (reduced vomiting), and mental state (reduced nausea and malaise) domains. However, it may also have negative impacts in the behavioural interactions domain if the anti-emetic induces fatigue, thereby reducing the animal's ability to interact within its environment, with other animals, and with humans. A nuanced, whole animal, understanding of veterinary medicine could result from inclusion of more animal welfare training at this stage in the degree.



#### 4.1.3. Clinical Teaching

Clinical teaching is defined here as ‘on the job’ or ‘in-hospital’ training [58,59]. This can range from one to three years, depending on the veterinary school [55]. At this stage in the degree, the focus tends to be on medical and surgical cases, that is, how to diagnose and treat diseases or pathologies. Preventative care training is often focused on vaccination, parasite control, body condition management (e.g., body weight and body condition scores), and dietary recommendations. In the case of production animals, this focus also includes herd health concepts.

Overall, current veterinary curricula provide students with vast knowledge of indicators aligning to Domain 3 (Health) and some skills in Domains 1 (Nutrition), but limited knowledge of indicators contributing to welfare assessments aligning to Domains 2 (Physical Environment) and 4 (Behavioural Interactions) [33–35]. As all four of these domains should be considered when assessing the overall welfare status of an animal in Domain 5 (Mental state), it follows that the current training paradigm does not provide veterinarians with sufficient knowledge and skills to be animal welfare experts. Instead, the current training paradigm produces two dimensional (Nutrition and Health) experts. We propose that to be experts in animal welfare, veterinarians must consider all five domains in the animals under their care. The next section illustrates how this could be achieved.

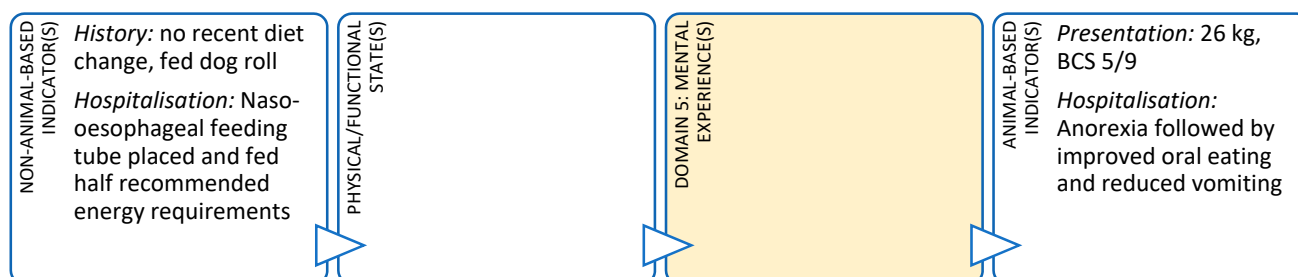
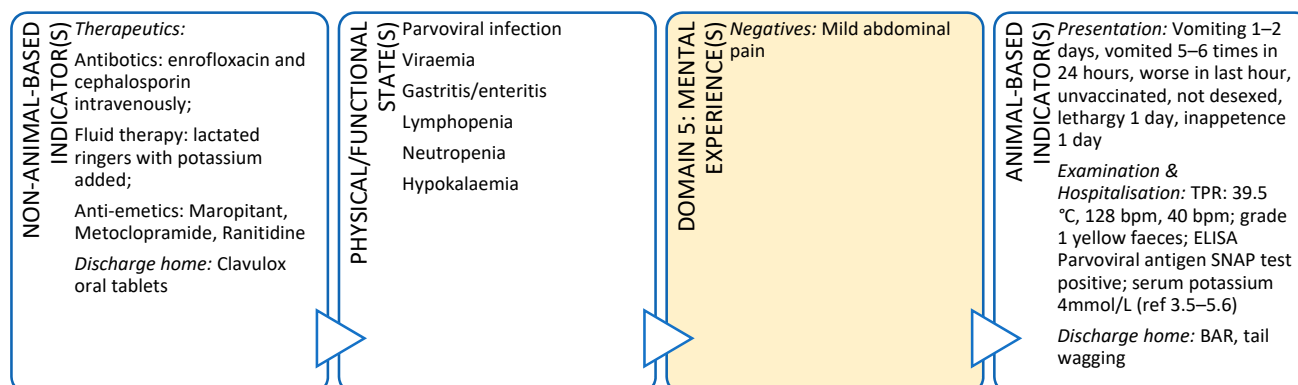
#### *4.2. Aligning Para-Welfare Knowledge to Improve Veterinary Animal Welfare Assessments and Create Animal Welfare Experts*

The current case-based focus of clinical training in veterinary medicine tends to limit animal welfare considerations to alleviation of negative experiences relating to just two domains (Nutrition and Health). This approach may also result in moral distress for veterinarians if a case is unsolvable and/or results in euthanasia of an animal under their care. If veterinarians are unable to evaluate multidimensional welfare impacts they may find it difficult to reconcile a euthanasia decision with the animal’s two-dimensional clinical picture [60]. Veterinarians do naturally assess the welfare of the animals under their care using indicators aligned to other domains, however, this process and the knowledge it leverages is not explicitly recognised. If animal welfare was embedded throughout the veterinary degree, students could more explicitly understand and articulate how they are evaluating welfare holistically and where the gaps in their assessments may be [37]. By way of example, veterinary students in their final year of study are often required to present a clinical scenario to their peers and teachers in a formal case rounds format (Box 2). Students use this opportunity to demonstrate their knowledge and understanding of a particular clinical syndrome or disease by explaining the aetiology, epidemiology, pathophysiology, and treatment outcomes for their chosen case. By taking this approach, the focus of these case presentations has been on the physical/functional state of the animal and particularly impacts in Domains 1 and 3. However, there is potential for a holistic animal welfare evaluation to be undertaken, with a focus on the mental experiences of the animal, by incorporating a comprehensive Five Domains assessment into these student presentations. By putting greater emphasis on what the animal itself experiences during clinical assessment and treatment, student clinicians might reach different conclusions about a treatment or euthanasia decision for an animal. This kind of integrated approach to animal health and welfare has the added benefit of cementing student understanding of animal welfare, improving animal welfare literacy, and allows them to act as experts in their future clinical work [37].

**Box 2.** Veterinary student rounds case study.

**Scenario:** A final year veterinary student is presenting a case of an 11-month-old cross breed dog that presented to the clinic for vomiting, lethargy, and inappetence. This dog was unvaccinated and had mild abdominal pain, hyperthermia, and grade 1 yellow faeces. A problem list and differential diagnoses are discussed and Parvovirus suspected. An ELISA antigen snap test was positive for Parvovirus. The student goes on to describe the pathophysiology of parvoviral infection in dogs, the treatment protocol (including intravenous fluid therapy, antibiotics, anti-emetics, and naso-oesophageal feeding tube placement), and concludes with the financial costs of treatment.

In this case study, details from the original presentation illustrate its alignment with the Five Domains Model. From this we can see that the original presentation focuses on Domains 1 (Nutrition) and 3 (Health), with only nominal mention of an affective experience (pain) aligned with Domain 5. Domains 2 (Physical Environment) and 4 (Behavioural Interactions) have not been discussed and the physical/functional state of the animal is also inadequately presented using a traditional case rounds format.

**DOMAIN 1: Nutrition****DOMAIN 3: Health****4.3. Continued Professional Development**

In common with the clinical training of veterinary students, and for reasons already discussed, there is a need for practicing veterinarians to improve their animal welfare science literacy, with a particular focus on animal welfare assessments [37]. Some options already exist for New Zealand-based veterinarians to undertake continued professional development in animal welfare. The Australian and New Zealand College of Veterinary Scientists (ANZCVS) has an Animal Welfare Chapter with membership examinations offered every two years [61]. The University of Edinburgh offers a post-graduate certificate, diploma, or Master's degree in International Animal Welfare, Ethics, and Law [62,63]. These two options have the advantage of being offered at a distance, and veterinarians can study towards the related qualifications in their own time. However, the learning outcomes for both options are more theoretical than practically focused, and those for the Edinburgh post-graduate qualifications are not specifically focused on veterinarians. There is a need for veterinary-specific animal welfare training for practicing veterinarians that is both practical and comprehensive. To achieve this, training should be co-designed alongside veterinary end-users (e.g., clinical veterinarians from a range of backgrounds

and practice types, industry veterinarians, and those working as animal welfare officers) and with practical applications in mind.

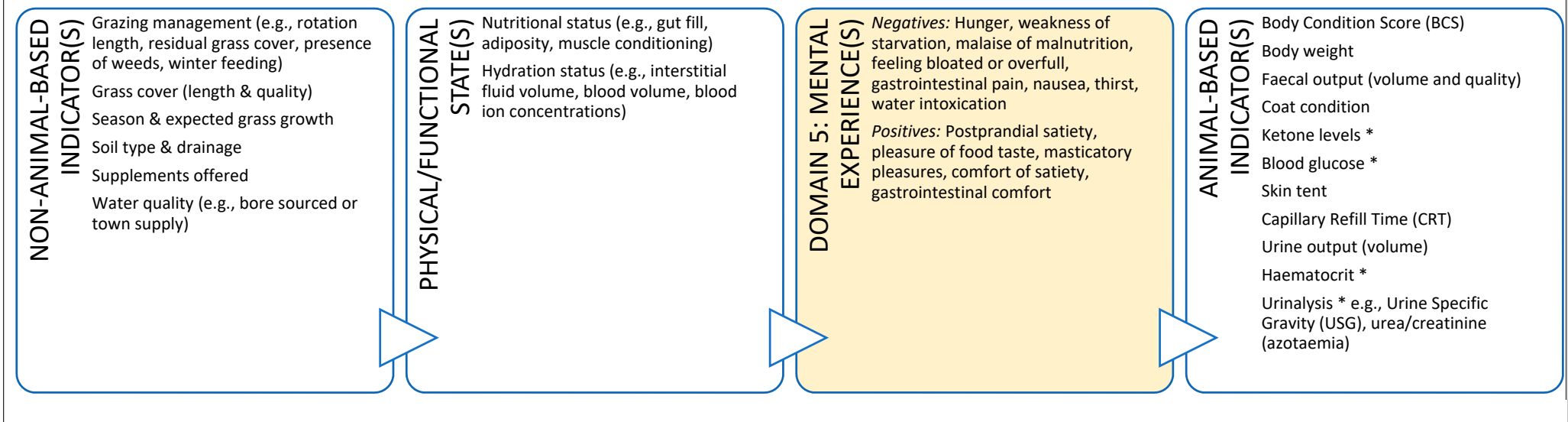
A training initiative that focuses on practical use of animal welfare science for veterinarians is likely to improve animal welfare literacy, as well as empower veterinarians to act as experts in their daily lives. This training could also offer a means of operationalising the Five Domains Model for use by practicing veterinarians in a range of contexts. By way of example, Box 3 illustrates the potential role a clinical veterinarian can take to advance the welfare of dairy cattle during a routine herd health consultation and support their client at the same time. Many dairy cattle veterinarians evaluate grass cover as they drive through the farm gate to visit a cow or cows. Grass cover is a non-animal-based indicator of feed availability (quantity and quality) and can help alert a veterinarian to a problem if the cover is insufficient for the feed requirements of a dairy herd. In other words, low grass cover may alert a veterinarian to a potential nutritional inadequacy which may result in animals experiencing hunger in the future if the situation is not rectified. These implicit welfare assessments by veterinarians are performed during routine on-farm animal interactions but without locating them within the broader context of animal welfare. A more explicit approach would allow veterinarians to explain and justify their choice and interpretation of indicators of welfare and have more confidence in their welfare assessments and client recommendations.

In addition, a veterinarian in this context could use all five domains to make recommendations that could enhance the welfare of the animals under their care (Box 3). In discussion with the farmer (and illustrated using the Five Domains Model), a veterinarian can describe the importance of various welfare indicators (e.g., shelter/shade and resting areas – usually Domain 2, enrichment opportunities such as cow brushes, appropriate grazing management, positive human-animal interactions and good stockmanship) aligned to Domains 2 (Physical Environment) and 4 (Behavioural Interactions) that have the potential to provide for positive mental experiences and enhanced welfare for these animals. There is also scope for veterinarians to understand more about these welfare indicators, what they represent about the animal's potential welfare status, and how directly they reflect this i.e., input (Box 3, left side: non-animal-based) versus output indicators or welfare (Box 3, right side: animal-based).

**Box 3.** Production animal case study.

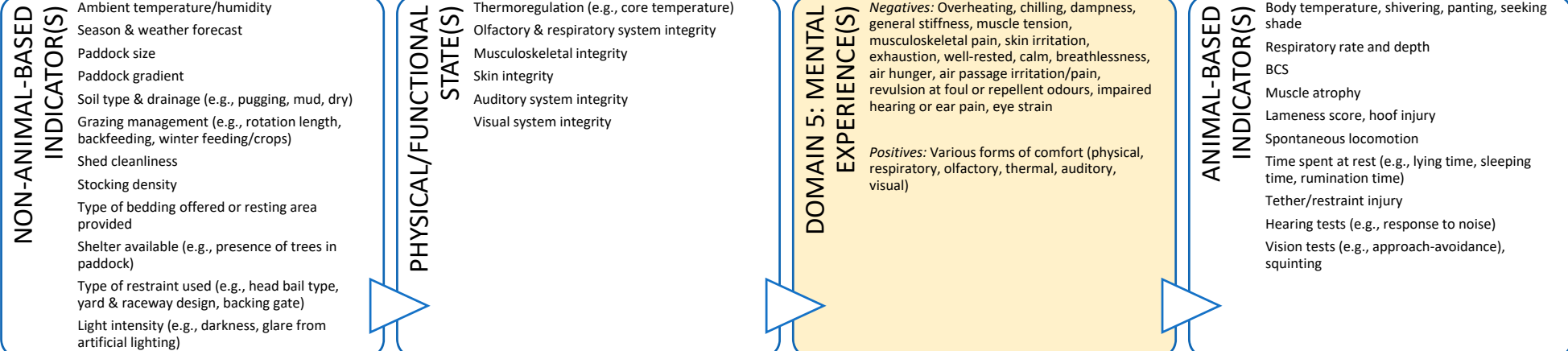
**Scenario:** You are a large animal veterinarian who has a routine on-farm dairy cow herd health evaluation scheduled on an extensive (pasture-based) farm. This farm supplies milk to a company that pays a premium for milk from farms with an animal welfare plan. To obtain this premium, a veterinarian must help the farmer develop and implement this animal welfare plan. In preparation for your visit, your practice has developed a discussion framework based on the Five Domains Model.

This case study uses the Model to illustrate the welfare indicators that could be discussed with the farmer for physical/functional states (Domains 1 to 3) or external situations (Domain 4) and the potential welfare implications (mental experiences) these might indicate in Domain 5. Indicators more appropriate for veterinary-based welfare assessments have been identified with an asterix.

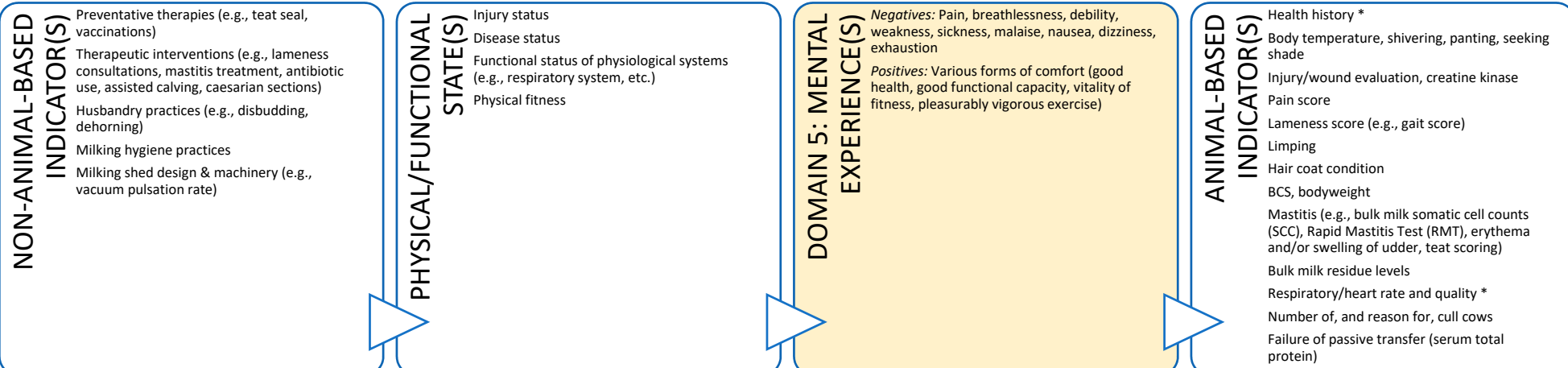
**DOMAIN 1: Nutrition**

## Box 3. Cont.

## DOMAIN 2: Physical Environment



## DOMAIN 3: Health



## Box 3. Cont.

## DOMAIN 4: Behavioural Interactions (with the Environment)

NON-ANIMAL-BASED  
INDICATOR(S)

Grass cover (length & quality)  
 Paddock size  
 Stocking density  
 Type of bedding offered or Resting area provided  
 Shelter available (e.g., presence of trees in paddock)  
 Presence/absence of environmental enrichment opportunities (e.g., self-grooming brushes)  
 Presence/absence of threatening environmental elements (e.g., noise from machinery, visual disturbances, stray voltage)  
 Grazing management (e.g., rotation length, backfeeding, winter feeding/crops)

## EXTERNAL SITUATION(S)

Perceived agency within environment  
 Environmental enrichment type(s): Occupational, Physical, Sensory, Nutritional

DOMAIN 5: MENTAL  
EXPERIENCE(S)

*Negatives:* Boredom, helplessness, depression, withdrawal, neophobia, hypervigilance, anger, frustration, negative cognitive bias  
*Positives:* Interested, pleasantly occupied, calm, in control, engaged, energised, focused

ANIMAL-BASED  
INDICATOR(S)

Injury/wound evaluation  
 Time spent at rest (e.g., lying time, sleeping time, rumination time, grooming)  
 Engagement with enrichment opportunities & time budget estimates (e.g., time spent eating or using grooming brushes)  
 Escape avoidance behaviours directed at environmental elements (e.g., distancing, sudden movement away)

## DOMAIN 4: Behavioural Interactions (with Other Animals)

NON-ANIMAL-BASED  
INDICATOR(S)

Presence/absence of other cows, presence of dominant cow  
 Presence/absence of calf, calf removal process  
 Presence/absence of other animals (e.g., dogs), use of dogs (e.g., when, where, how often)  
 Type of restraint used (e.g., head bail type, yard design, backing gate, milking shed design)

EXTERNAL  
SITUATION(S)

Perceived agency for interactions with other animals  
 Environmental enrichment type(s): Social  
 Social status

DOMAIN 5: MENTAL  
EXPERIENCE(S)

*Negatives:* Loneliness, boredom, yearning for company, thwarted desire to play, sexual frustration, anger, anxiety, fear, panic, insecurity, neophobia, hypervigilance, exhaustion  
*Positives:* Affectionate sociability, maternal, paternal or group rewards, excitation/playfulness, sexually gratified, alert engagement, highly stimulated, secure, protected, confident, energised, refreshed

ANIMAL-BASED  
INDICATOR(S)

Cow hierarchy and dominant cow behaviours towards herd  
 Herd behaviour while moving to milking shed (e.g., steady pace, bunching, heads up/heads down)  
 Behaviour in yards (e.g., bunching, heads up/heads down, hierarchical re-arrangement, sudden movements, steady flow into yards)  
 Behaviour in milking shed (e.g., flinch, step, kick during milking)  
 Failure of passive transfer (serum total protein)  
 Play behaviour (esp. calves)

## Box 3. Cont.

## DOMAIN 4: Behavioural Interactions (with Humans)

**NON-ANIMAL-BASED INDICATOR(S)**

- Stockperson observations \*—behaviour while moving to milking shed, in yards, and in milking shed (e.g., gentle/rough handling, low/raised voice, pressure exerted on herd)
- Stockperson experience (e.g., number of stockpeople, experience with cattle, training)
- Stockperson attitude (e.g., uncertain, indifferent, insensitive, impatient, confident, caring, sensitive, patient)
- Type of restraint used (e.g., head bail type, yard design, backing gate)

**EXTERNAL SITUATION(S)**

- Perceived agency for human interactions
- Environmental enrichment types: Social, Occupational
- Human attributes & behaviour towards animals

**DOMAIN 5: MENTAL EXPERIENCE(S)**

*Negatives:* Anxiety, fear, panic, terror, neophobia, insecurity, confusion, uncertainty, persistent unease, helplessness, pain from injuries, negative cognitive bias

*Positives:* Calm, confident, at ease, in control, enjoys variety

**ANIMAL-BASED INDICATOR(S)**

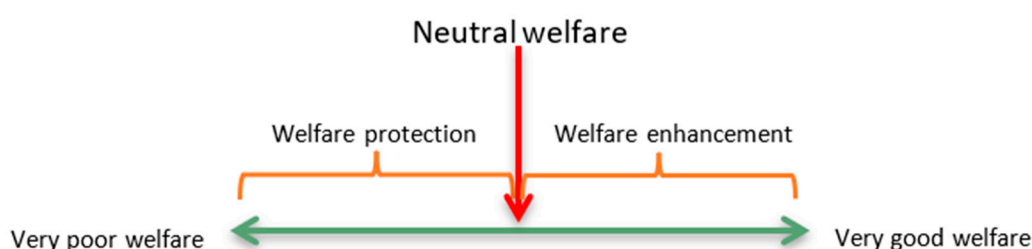
- Avoidance/flight distance
- Animal demeanour towards stockpeople (e.g., kicking, avoiding, sudden movement away, vocalisations)
- Evidence of effective/ineffective learning/training (e.g., time to learn new route to shed)
- Bulk SCC
- Faecal contamination



### 5. Proposed Approach to Teaching Animal Welfare Science in Veterinary Curricula and Potential Benefits of This Approach

We propose to reframe veterinary science training to sit within the wider discipline of animal welfare science, that is, training veterinarians as animal welfare experts instead of viewing veterinary science and animal welfare science as either synonymous or as separate entities. The basic premise of our proposed reframing is that veterinary science is an integral part of animal welfare science but that it is not the whole of animal welfare science. The goal of this reframing is to produce veterinarians competent and confident to assess welfare in a more comprehensive manner and in a wider range of situations, thus fulfilling society's growing expectations of the profession [37]. With this approach, we propose to move the focus of veterinary education and duty of care from Two Domains (Nutrition and Health) towards considering the welfare of animals, and the role of the veterinarian, in all Five Domains.

There are two key considerations that need to be addressed to allow for this reframing to be achieved. Firstly, veterinarians are currently trained to be experts at recognising, diagnosing, and addressing physical events or states that lead to survival-critical negative mental experiences such as pain, sickness, discomfort, hunger, thirst, breathlessness, and thermal stress. Most welfare indicators used by veterinarians align to physical/functional states in the Nutritional domain (Domain 1) or Health domain (Domain 3), for example, signs of nutritional inadequacy, functional impairment (e.g., lameness examinations), signs of disease, and injuries. The resultant unpleasant experiences of these physical/functional states are critically important, not only to the animal's survival and productivity but also to its welfare. However, preventing or alleviating such unpleasant experiences will, at best, take an animal along the continuum from some degree of negative welfare state to a neutral state [21]. In other words, simply preventing or rectifying health and production problems does not provide for good welfare or what we might consider a 'good life' or a 'life worth living' for animals [27]; thus, we might characterise this current role of veterinarians as one of animal welfare 'protection' (Figure 3). To provide for good welfare, animals must also have some positive experiences; this is the 'welfare enhancement' to which we now aspire and to which veterinarians, if trained appropriately, can make major contributions (Figure 3).



**Figure 3.** The animal welfare continuum and the roles of veterinarians in protecting (preventing or alleviating negative experiences) and enhancing (promoting positive experiences) on each side of neutral.

Secondly, we are particularly interested in how to further the use of indicators aligning to Domain 4 (Behavioural Interactions) by veterinarians. The positive affective experiences resulting from conditions (i.e., the animal's perception of their external situation) in Domain 4 have the potential to enhance an animal's welfare. This domain is often assessed by considering how well agency is exercised by animals. If animals can fully exercise their agency through the provision of choice and control, their welfare is likely to be evaluated as good.

Veterinarians can enhance animal welfare by recognising impediments to agency and opportunities for improvements that allow animals to exercise their agency. Therefore, to become animal welfare experts, veterinarians must be skilled at assessing and promoting opportunities in Domain 4. By way of example, a veterinarian can make recommendations



for how owners might provide opportunities for indoor-only cats to exercise agency (Box 4). If the cat in this situation engages with these opportunities, they are likely to experience positive affective engagement in the form of mental experiences such as playfulness, calmness, and confidence. Therefore, the veterinarian in this example has enhanced the welfare of this cat by assessing its welfare, identifying areas for improvement, and making recommendations that give the cat opportunities to exercise agency, thereby promoting a good life. These discussions can move the veterinarian's role from one of welfare protection towards promoting welfare enhancement.

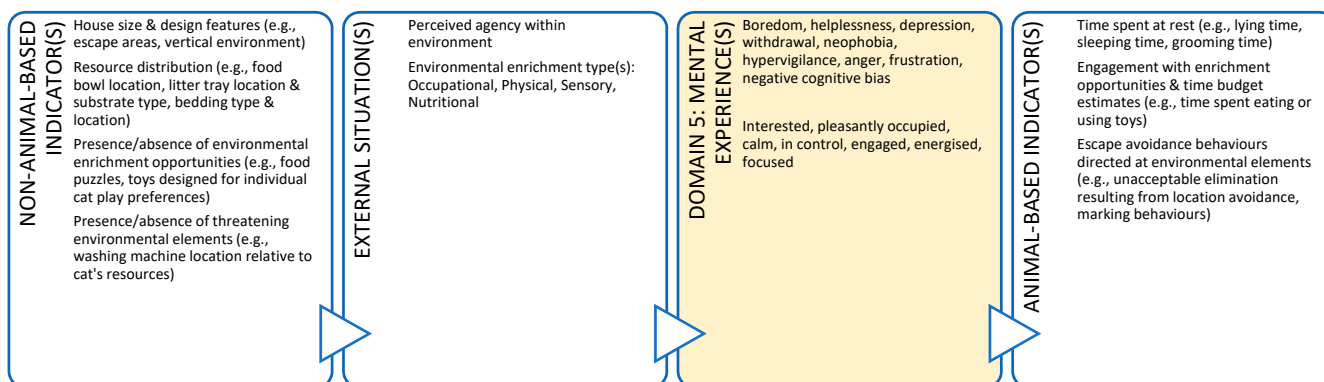
In contrast to its current isolated pre-clinical location in veterinary curricula, we propose that animal welfare science should be integrated within all years of veterinary student training programmes. This has several benefits, it: (1) allows for an applied understanding of animal welfare science alongside other related disciplines; (2) encourages integration of student knowledge towards better overall understanding; (3) represents an improved pedagogy for veterinary training; and (4) allows for the role of veterinarians as animal welfare experts to be realised. By incorporating animal welfare science throughout the degree and recognising the need for welfare-centric training, veterinarians will be able to align their veterinary knowledge with an internationally recognised, science-based animal welfare assessment framework; thus, fulfilling their role to society as animal welfare experts.

#### Box 4. Companion animal case study.

**Scenario:** An owner has brought their new kitten to your clinic for its second vaccination. The owner is anxious about the potential impact of their cat on the birdlife in and around their property if they allow it outdoor access. However, they are also of the view that cats need to go outside to lead a full and happy life. The owner has asked you whether they could ensure their cat has a good life as an indoor-only cat.

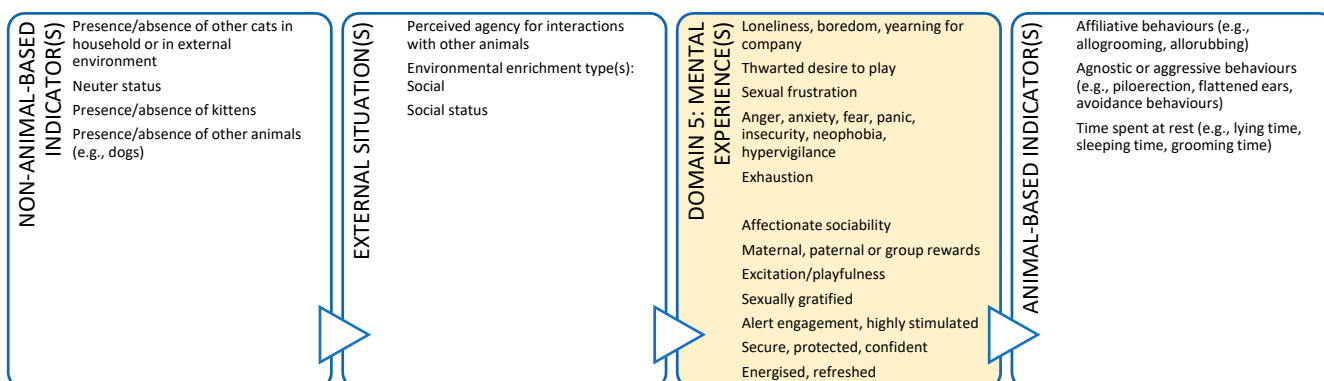
This case study illustrates how veterinarians can provide animal welfare guidance to owners of indoor-only cats which could enhance the cat's welfare. A full Five Domains assessment should be performed and discussed with the cat's owner because there are potential welfare implications of an indoor-only lifestyle in Domains 1 to 3 (e.g., potential for overfeeding leading to obesity and joint disease with resultant experiences of pain and debility). However, for brevity, we have only shown how the discussion could be framed for features collated in Domain 4. Exploration of welfare indicators relating to the animal's perception of its external situation and the associated mental experiences (Domain 5) is a useful way of framing this discussion.

#### DOMAIN 4: Behavioural Interactions (with the Environment)

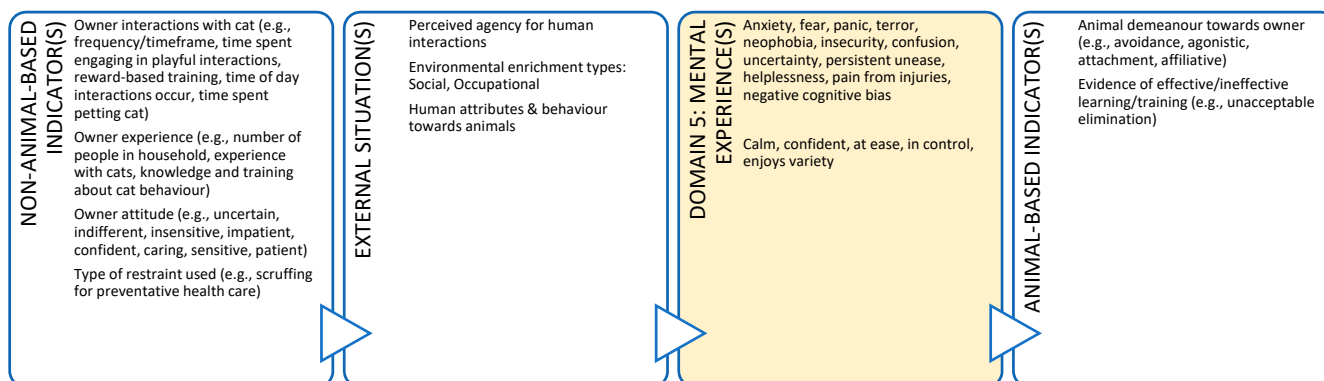


## Box 4. Cont.

## DOMAIN 4: Behavioural Interactions (with Other Animals)



## DOMAIN 4: Behavioural Interactions (with Humans)



## 6. Conclusions: The Key to Advancing Veterinary Animal Welfare Expertise and Literacy Is through Initial Training and Continued Professional Development

In summary, for veterinarians to be positioned as experts in animal welfare science, they need to first have a holistic and contemporary understanding of what animal welfare is and how it can be scientifically assessed. Veterinarians also need to be motivated to engage with the broader disciplines of animal welfare (science, ethics, policy, and law) and empowered to act as experts in their daily lives. For example, clinical veterinarians need to be able to recognise animal welfare compromise and identify opportunities for welfare enhancement in the animals they care for. The Five Domains Model offers a comprehensive framework for including animal welfare science into veterinary science curricula. Acknowledging the already burgeoning veterinary curriculum, the approach presented here offers a way of integrating animal welfare science across existing curricula without significantly increasing content [37]. This Five Domains approach integrates, reinforces, and reframes animal welfare science in veterinary training to develop welfare literacy [37]. Ethical reasoning skills and knowledge of relevant laws and policies will add to this welfare literacy [64]. Such literacy can then be enacted by aligning this framework with human behaviour change theory [65] and communication skills training [66] to position veterinarians as animal welfare experts.

In this article, we have focused on veterinary training in the first instance to improve animal welfare literacy in the veterinary profession. There are opportunities to advance animal welfare training for veterinarians during their initial education (undergraduate or postgraduate veterinary curricula) and through continued professional development during their veterinary careers. Education is an important step to developing competence,

which in turn assists with confidence and workplace satisfaction [67,68]. Appropriate animal welfare training for veterinarians could empower them to act as experts in their daily lives and advance their duty of care from two domains of welfare to all five.

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