Editor

It was with much interest that I read Dr Paul Hardy-Smiths' (PHS) review of the Text; Fish Vetting Essentials (FVE) by Dr Richmond Loh (RL) and Dr Matt Landos (ML) in the Australian Veterinary Journal Volume 91, No 4, April 2013, p159. It was of interest to me on two levels, a number of PHS criticisms of fact were actually wrong and secondly that the AVJ, a world renowned veterinary journal, would print such a scathing review of a veterinary text. Particularly where the world of aquatic animal health is so small and where the reviewer personally knows the authors. I would have thought a better forum for this sort of critical review would have been over the phone or at a relevant conference where the differing opinions could have been expressed over a beverage or two. Venting in an international journal is disappointing at best and unprofessional at worst. I hope this trend in or profession will cease and would request of the AVJ in future not to place itself in a position where it may passively catalyze these types of interactions between veterinarians.
I too work in the field of aquatic animal health and see it my duty to inform those in the profession who may not undertake fish work, of some of the factual errors in PHS's assessment of the content of FVE.

On the subject of temperature ranges for fish species It was PHS's assessment that "the information provided in *Fish Vetting Essentials* on farmed fish and other aquatic species is limited and at times, potentially detrimental", making references to the published temperature requirements of rainbow trout and barramundi in a bid to discredit the accuracy of the book. In his comments regarding temperature requirements the reviewer has assumed the temperatures quoted in the text are optimal for commercial production however the natural optimal and tolerance ranges of any species quoted are a lot wider than what might be accepted for commercial production ranges. It is important to note that the temperature ranges published in FVE and in other reviewed texts (see references below) make a distinction between 'optimal' and 'tolerance' ranges.

In FVE the authors state that the optimal temperature range for rainbow trout is 14-18 °C and their tolerance range is from -1 to 25 °C. The Food and Agriculture Authority (FAO) publishes optimal temperature ranges of 9 to 21°C and a tolerance range of 0 to 27 °C. Dept of Primary Industries Victoria considers the optimum water temperature range is 10 to 22 °C and a tolerance range of 0 to 30 °C. The Southern California Edison who published a literature review on (rainbow) Trout Temperature Requirements found that the upper incipient lethal temperature (UILT) for rainbow trout is within the range 25 to 30 °C, but are able to maintain weight at 25 °C for 30 days.

It was my experience that the water temperatures in some areas of Tasmania this summer (2012/2013) reached an upper limit of 25 °C. Whilst it did stress the wild and farmed trout, most survived. In some trout growing areas in Australia farmers are selectively breeding for fish with an increase in upper range of tolerance. The Pemberton (WA) rainbow trout farm has been selectively bred for temperature tolerance over the years and have a LT_{50} of 28.5 °C. A Canadian group is planning to come to WA to study the genetic basis of this increased tolerance range with as this genetic line of fish may be valuable with respect to stocking trout in areas of the world adversely effected by climates change.

The reviewer's (PHS) opinion on the temperature requirements for barramundi also differed from tha quoted in FVE, stating that the published lower tolerance range of 15 °C and the optimal at 25 °C do not fit with his acceptable optimal range of 27 to 30 °C. However, DPIFM's Fishnote number 27 (2006, p5) states that "Barramundi inhabit areas where the water temperature ranges between 23°C to 35°C... in Queensland." The NT Government published a *Barramundi Farming Handbook* (2007, p4) that states "Barramundi fingerlings are known to survive in water... temperatures up to 35°C. They can also survive temperatures as low as 16 °C. The optimum temperature for growth of NT barramundi is between 28 to 32 °C." Personal communications with colleagues in NT suggests that in a dry season day, the ambient temperature can fall to 15 °C and the water temperature in barramundi farms in Northern Territory can drop to around 20 °C. These are natural occurrences and nature surely cannot maintain it at 27 to 30 °C all year round. There are also cases where aquaponically grown fish only started become ill in the middle of May (mid-autumn in Perth), when water temperature ranges dropped to as low as 13 to 17 °C. In Queensland, the water temperatures in barramundi farms get down to 15 °C in cold years without mass mortality and in stocked impoundments illness was observed only when the water temperatures dropped to ~12 °C, two years ago (which was extreme).

To summarise, PHS's comments regarding temperature ranges for fish are contrary to the published and experiential evidence of the authors.. The information published in "*Fish Vetting Essentials*" is well-researched, being a combination of literature reviews of natural occurrences, experimental data and professional experience. The inclusion of the latter means that some of this information is not found elsewhere and it is the unique point of difference.

It would appear there is wide support from fish health professionals from overseas with respect to the temperature ranges that have been published in FVE

The reviewer was also concerned that recommended use of malachite green was not always accompanied by a warning about its use being banned in food fish. However, in FVE in 4 of 8 references to malachite green (see pages *116, 156* and *168),* we state that the dye is carcinogenic and is prohibited from use in food fish. There is also a useful index that readers can use to cross reference. Many learned veterinarians might also be aware that most medicines worldwide used for the treatment of aquatic animals will be used under a veterinarians care and will be used off-label.

It is apparent from the style of writing that there is a strong focus on the individual fish patient with large sections about imaging, anaesthesia, surgery, breeding and a myriad of ornamental fish pictures since the target audience is the general veterinary practitioners.

The first edition, is in a practical format and the authors have received many positive reviews contrary to that published in the AVJ, which I discovered at http://wp.me/p1BQjt-192

I have not gained personally by authoring this submission to the AVJ but only seek to put some of the record straight and plea that my colleagues take a collaborative approach for the good of the profession.

Regards
Dr Stephen B. Pyecroft BVSC (Hons) PhD MANZCVSc (Aquatic & Pathobiology)

References

Department of Primary Industries Victoria (2010) **A Guide to the Inland Angling Waters of Victoria. Rainbow trout (*Oncorhyncus mykiss*).** Retrieved April 13, 2013, from http://www.dpi.vic.gov.au/fisheries/recreational-fishing/inland-angling-guide/fish-species.

FAO (2013) **Cultured Aquatic Species Information Programme. *Oncorhynchus mykiss.*** Fisheries and Aquaculture Dept. Retrieved April 10, 2013, from http://www.fao.org/fishery/culturedspecies/Oncorhynchus_mykiss.

G Schipp, J Bosmans & J. Humphrey (2007) **Northern Territory Barramundi Farming Handbook.** DPIF&M.

Q. Allsop, P. de Lestang*, R. Griffin* and G. White*, (2006) **Barramundi - Your Questions Answered.** Fishnote No 27. Fisheries Research, Darwin.

Southern California Edison (2007) **Trout Temperature Requirements (Literature Review).** Environmental Assessment. FERC Project Nos 2085, 2175, 67 and 120.