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Integrating the issues of global and veterinary public health into the veterinary education curriculum: an Australian perspective

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Summary
This article discusses the integration of global and veterinary public health issues into the Australian veterinary curriculum. Formal veterinary education in Australia has a history of over 100 years and veterinarians have played a major role in the control of zoonotic and transboundary diseases for an even longer period. Australia is the largest exporter of red meat and live animals in the world. Therefore, educating veterinarians to promote and ensure food safety and animal welfare is prominent in Australian veterinary curricula. Veterinary degrees are accredited to allow Australian graduates to work professionally overseas, including in the United Kingdom and United States of America, and, in recent years, globalisation of the student body at Australian veterinary schools has occurred. For this reason, an appropriately broad curriculum is required to produce graduates who are able to address challenges in veterinary public health throughout the world. A Public Health University Network has been established to harmonise the veterinary public health curricula at the various veterinary schools and to develop the 'Australian veterinary public health philosophy', with its links to global issues and the 'One World, One Health' concept. Finally, conclusions are drawn on the implications of veterinary public health teaching in Australia and the preparation of Australian graduates for the global profession.

Keywords
Animal welfare – Australia – Biosecurity – Curriculum – Food safety – Globalisation – One World, One Health – Veterinary public health – Zoonoses.

Introduction

Australia is a vast continent, spanning several different climatic zones, from temperate to sub-tropical, with a wide range of unique native animals occupying every niche. In addition, many non-native animals have been introduced, from the dogs and rodents that arrived with the earliest inhabitants to a multitude of domestic and feral animals brought with the later settlers, including cattle, sheep, pigs, goats, horses, camels, rabbits and foxes. Thus, in this mix of old and new, a myriad of infectious agents exist, many of which have adapted over the centuries to their animal hosts, but others which have only recently been introduced in the last two hundred years. As cattle and sheep provided the stimulus for the early and rapid economic growth of the new colony, it is not surprising that the impetus for the foundation of veterinary education in Australia came from a need to control the diseases that limited their production, many of which were due to both animal and human pathogens. Only by examining the history of the veterinary profession and veterinary education in Australia can the

reasons why the issues of global and veterinary public health are of such significance to this country be understood.

History of veterinary education in Australia

From the arrival of the first European colonists in 1788, the early days of colonial Australian settlement required the importation of domestic stock from many other countries, including the United Kingdom (UK), South Africa, India and Indonesia (18). However, it wasn't until the mid-to-late 1800s that laws were passed in an attempt to prevent the introduction of contagious diseases of cattle and sheep. By this time, however, despite long sea journeys acting as a form of quarantine, a number of important diseases had been introduced and some had become endemic. As the veterinary profession became established, and more involved in trying to control these diseases, it became imperative to establish veterinary schools to answer the increasing need for veterinarians.

Some basic veterinary training was delivered at a number of agricultural colleges, and a private veterinary school with the first four-year curriculum in the world, the Melbourne Veterinary College, was established by W.T. Kendall in Fitzroy, Victoria, in 1888. However, the first university veterinary school was not established until 1908, when the Melbourne Veterinary College was transferred to Melbourne University (12). This was followed by a second school at the University of Sydney in 1910. A third school was inaugurated in Brisbane, Queensland, in 1936. However, during the war years, both Melbourne and the University of Queensland schools were temporarily closed.

After World War II, agriculture became increasingly important and this was mirrored by an expansion in student numbers graduating from the three schools. In 1979, a fourth school was opened at Murdoch University in Perth, Western Australia. In the last five years, three more schools have opened: at Charles Sturt University in Wagga Wagga, New South Wales; James Cook University in Townsville, North Queensland, and at the University of Adelaide in South Australia. While it is difficult to determine exactly when veterinary public health became an important discipline in its own right, in the curricula of the early veterinary schools, it is safe to say that the teaching of zoonoses was embedded from the earliest days, due to the serious problems caused by such diseases in the livestock sector. The earliest issues of the *Australian Veterinary Journal* from 1925 contain reports of bovine tuberculosis and its control in those dairy herds springing up to supply the growing populations of the major cities.

Brief history of zoonotic and transboundary diseases in Australia

While the geographic isolation of Australia prevented the introduction of many exotic diseases, with the long sea voyage acting as a quarantine period, a number were introduced that were of significance to both animal and human health and to the agricultural economy. These diseases, which would now be termed transboundary animal diseases or foreign animal diseases, included the non-zoonotic but economically important:
– rinderpest
– contagious bovine pleuropneumonia
– sheep scab (mange, caused by *Psoroptes ovis*)
– foot and mouth disease (FMD).

The zoonotic diseases included:
– bovine tuberculosis
– brucellosis
– hydatidosis
– anthrax (11).

Their control or eradication, in the very early days of the veterinary profession in Australia, was testament to the pioneers of the profession and to the importance of agriculture to the economy of the new country.

Foot and mouth disease was introduced in the 1870s. However, it was eradicated within a couple of years and never became the problem that it has been in other parts of the world. Rinderpest was introduced from Asia into Western Australia in 1923, but was eradicated, through quarantine and slaughter, within two months, following a concerted effort involving government veterinarians from across Australia. Contagious bovine pleuropneumonia, on the other hand, became well established throughout Australia after its arrival in Victoria in 1858, and took over one hundred years to eradicate (17). Between the 1860s and the 1880s, anthrax was responsible for high mortalities in cattle and sheep, resulting in the establishment of a laboratory associated with the Pasteur Institute, which produced a two-dose anthrax vaccine, and the pioneering of a single-dose spore vaccine by two local Australian veterinarians, Gunn and McGarvie-Smith (20). It was believed that anthrax was imported into Australia in meat and bone meal from India, which was used both as an animal remedy and a fertiliser. Despite its significance to the livestock industry, anthrax fortunately never became an important zoonosis. The banning of the importation of meat and bone meal into Australia that was implemented in the 1950s, to prevent any further incursions of anthrax, had an unexpected benefit. Australia also avoided any cases of bovine spongiform encephalopathy (BSE), which

was spread from the UK to many countries during the 1980s by the exportation of meat and bone meal.

Potentially the most serious zoonosis imported into Australia was bubonic plague, at the turn of the 20th Century. In all, some 550 deaths were reported between 1900 and 1910, when the disease was brought under control. Outbreaks were recorded in populations close to the ports in Sydney, Melbourne and Perth. However, diligent public health measures, including quarantine and the trapping of rats, meant that the devastating disease never gained a foothold in the continent (9).

Cystic hydatidosis was identified as a serious public health problem on mainland Australia by the mid-1800s, and later became an issue in Tasmania. It is unclear when the parasite was introduced. However, cysts in kangaroos were documented as early as 1790 and *Echinococcus granulosus* was reported in dingoes in 1886 (13). The importance of wildlife in the maintenance of zoonotic infections, a link that has become increasingly important with the recent emergence of several new zoonoses, became evident on mainland Australia with this disease. Kangaroos and dingoes provided an alternative life-cycle for the tapeworm to sheep and domestic dogs, making control of the parasite very difficult. In Tasmania, however, where dingoes had not been introduced, the institution of strict control measures from the mid-1960s resulted in the eradication of the disease from the state within 30 years.

Two of the most important diseases introduced into Australia with imported animals, which had a significant effect on both cattle and human health, were brucellosis, caused by *Brucella abortus*, and bovine tuberculosis, caused by *Mycobacterium bovis*. While it is unclear exactly when these were introduced, they were probably imported with cattle from Europe in the early days of the new colony. Both diseases spread to become a significant economic problem countrywide, causing stock losses, human illness and losses due to trade restrictions. While control measures had been applied in all Australian states for many years, with the initial motivation being to protect human health, a decision was taken in 1970 to eradicate both diseases. Despite strong government support, however, the national Brucellosis and Tuberculosis Eradication Campaign took over 25 years and a billion Australian dollars before it was finally declared a success (14). Lessons learned from this campaign were shared internationally with other countries experiencing problems with these diseases.

Another zoonosis of significance was leptospirosis. Ironically, although it later became an important occupational illness in the cattle and pig industries, it initially caused problems in the sugar cane industry, due to the contact between workers and rodent urine. A lot of the early research into the epidemiology of leptospirosis was carried out in Australia in the 1920s, resulting in changes to production practices in the sugar cane industry, in which the sugar cane was first burned to remove rodents before being harvested (10). After the discovery of serovars Pomona and Hardjo in the 1940s and 1950s, as the cause of occupational infections in the pig and dairy cattle industries respectively, vaccines were developed to immunise the stock and thus protect humans from exposure. These vaccines are still in use today.

A significant milestone in veterinary public health in Australia was the discovery, by the Nobel Laureate, Sir Frank Macfarlane Burnet, of *Coxiella burnetii*, the agent of Q (for Query) fever, the cause of occupational respiratory infections in abattoir workers in Queensland and New South Wales in the 1930s. From the pioneering work of Burnet, a vaccine was developed for use in agricultural workers at risk from such infections (including veterinarians), and this is still used widely as a preventative measure (16).

In the last 20 years, Australia has again been at the forefront of research into 'emerging zoonoses', with arboviruses and bat-borne viruses becoming important public health issues, both in this country and globally (15). Veterinarians from Australia have worked closely with overseas researchers in the Asia-Pacific region to investigate the ecology and epidemiology of significant diseases such as severe acute respiratory syndrome (SARS), Nipah virus and Japanese encephalitis, contributing greatly to their prevention and control.

Thus, the impact of zoonotic diseases and the importance of veterinary public health were established very early in the development of the profession in Australia. The introduction of exotic diseases into Australia from its founding and the involvement of Australian researchers in regional and global disease investigations emphasise the importance of teaching veterinary public health to veterinary undergraduates from a global perspective.

Development of the meat industry and food safety

The first shipment of frozen meat exported from Australia to the UK was sent from Melbourne in 1879, following pioneering work in Victoria on the preservation of meat using industrial refrigeration. During the next 70 years, the export meat trade developed momentum and many problems associated with the export of meat, such as meat defects and microbial contamination, were investigated and overcome by researchers, working together with the industry. Australia is now the largest exporter of beef and veal in the world and produces almost one fifth of the total

global exports of all types of meat, including beef, lamb, mutton and goat (3).

With the exporting of meat came the development of a meat inspection service, regulations governing the production of meat and the involvement of veterinarians in the meat industry, largely in response to the demands of public health for the export markets. As early as the 1920s, importing countries were beginning to dictate standards, with a critical report by Dr Bubberman from the Netherlands, who examined the exportation of cattle and meat to the Dutch East Indies from Australia, resulting in an export ban from three Australian states and an insistence on continuous and direct veterinary supervision in export abattoirs (5). By the 1960s, meat and meat products exported to the United States of America (USA) were required to comply with the standards imposed by the US Federal Meat Inspection Act and Regulations. One requirement was that the slaughter of food animals and subsequent processing must be carried out under direct veterinary supervision, to ensure the recognition and removal of pathological conditions in animals slaughtered for human consumption and to supervise the hygienic processing of the meat (7). Although safe meat production and hygiene had been integrated into veterinary public health teaching in Australia from the earliest years, with the course at Sydney University in 1925 being entitled 'State Sanitary Science and Meat Inspection', it is interesting to note that the requirements for meat exports to the USA were probably the first instances where global issues related to trade, in particular animal diseases and food safety, had a significant impact on the veterinary curriculum.

A scandal in the meat export industry, involving the substitution and mislabelling of horse and kangaroo meat for deboned beef, destined for the US market, was detected in the early 1980s. This led to meat testing, to verify the species of origin, and a greater role for veterinary supervision at export abattoirs.

Given the origins of many of the food-producing animals in Australia, it is not surprising that the zoonotic food-borne pathogens causing problems overseas, such as *Salmonella, Campylobacter* and verotoxigenic *Escherichia coli*, are also prevalent in this country (2). Nevertheless, differences do remain, due largely to Australian biosecurity strategies. Some food-borne disease agents have been excluded from Australia, such as *S.* Enteritidis PT 4 and PT 8 (strains that have caused tremendous damage to the egg-producing industries in Europe and North America), and the devastating prion disease, BSE. These examples clearly support the need to educate veterinary students about diseases of public health significance that are exotic to Australia as, on graduation, they are in the frontline of defence against their incursion.

Animal welfare

While Australian veterinary students take an oath on graduation that they will 'relieve animal suffering', it is only in the past 20 years that the discipline of animal welfare has become embedded in the veterinary curriculum. It is now obvious that standards of animal welfare (for food-producing animals, in particular) are attracting much greater attention from consumers, retailers, governments and special interest groups. Rapid changes in animal welfare over the past decade have been driven largely by the trade in meat and live animals, as well as by increasing pressure from trading partners and the Australian public to improve conditions in this sector. However, problems still remain and practices such as the 'mulesing' of sheep to prevent flystrike have become global issues for animal rights groups, threatening the trade in wool and wool products from Australia. It is important to note, nevertheless, that legislation aimed at preventing cruelty to animals has been in place in all states of Australia for over a hundred years, with many of the original Prevention of Cruelty to Animals Acts being replaced in recent times by Animal Welfare Acts, reflecting changes in society and its perception of the importance of animal welfare.

Australia is a world leader in this area, with codes of practice for the welfare of animals from farm to slaughter having been developed and implemented for the last 20 years. Furthermore, a comprehensive Australian Animal Welfare Strategy was adopted in 2004, following extensive consultation with community and stakeholder groups, including the veterinary profession (1).

One particular area that has received considerable attention over the past few years is the livestock export industry. Australia is the largest livestock-exporting country in the world, sending approximately four million sheep, half a million cattle and 50,000 goats to many countries in the Middle East and Southeast Asia (8). This trade developed in the 1970s and 1980s for many reasons, but largely due to demand from overseas markets. Live cattle exports developed to service the establishment of feedlots in importing countries and due to the availability of cheap feed, and were driven by increasing affluence in those countries and their desire to eat more red meat. Live sheep and goat exports, on the other hand, have been largely driven by cultural requirements for animals to be used in local ritual slaughter, particularly during religious festivals.

While the live-exports trade is very important to the livestock production sector in Australia (it is worth around AUS$830 million in livestock sales and employs more than 12,000 people), a number of incidents of death and disease on-board ships, and concerns over the welfare of the animals after arrival, have led to a strong movement in the

country to ban the trade. In response, the Australian government has worked closely with the industry to develop standards for the export of livestock. In addition, veterinarians employed by both the government and industry have worked co-operatively with Middle Eastern trading partners and the World Organisation for Animal Health (OIE) to address public concerns and improve practices for the transportation, handling and slaughter of livestock in overseas markets. Memoranda of understanding have now been signed with several countries in the Middle East and North Africa, and the government and live-export industry are jointly funding initiatives to improve the infrastructure in ports and abattoirs in these countries and to provide training to improve animal handling and slaughter. Obviously, all of these measures have profound implications for the education of veterinary students, emphasising the need to introduce these issues and their outcomes into courses and providing a further example of the impact of global public health issues on the evolving veterinary curriculum.

Accreditation, employment and the globalisation of the student body

Given the European heritage of many Australian veterinary students, and the comparative isolation of the country, it has long been a rite of passage that young veterinarians will travel overseas for several years to work in foreign countries. The consequent requirement for veterinary degrees from Australia to be registerable in overseas countries resulted in the establishment of bi- and multilateral accreditation with overseas veterinary boards to facilitate the migration. Thus, all the established veterinary schools have long been accredited by the Royal College of Veterinary Surgeons (RCVS) in the UK; one requirement being that the curricula are designed to reflect global issues and to meet international standards. More recently, three Australian veterinary schools have become accredited with the American Veterinary Medical Association (AVMA).

For many years, a number of overseas students have come to study veterinary science in Australia, predominantly from Singapore, due to the absence of a veterinary school in that country. However, in the 1990s, changes in the government funding of Australian universities forced veterinary schools to make stronger efforts to attract foreign, full fee-paying students from overseas. This resulted in students travelling to Australia from many different geographical regions and cultural backgrounds, with increasing numbers of students coming from North America, Europe and a number of Asian countries. One effect of this was the need for North American students, in particular, to study at AVMA-accredited schools, so that their degrees were recognised in the USA on their return. Although Massey University in New Zealand achieved AVMA accreditation in 2001, Murdoch University was the first veterinary school in Australia to achieve this distinction, in 2002. This was followed by Sydney and Melbourne Universities during the last few years.

The emergence of many recent and well-publicised zoonotic diseases has led to an increasing worldwide profile for the discipline of veterinary public health. As a result of this, and the requirement to meet accreditation guidelines, both the RCVS and the AVMA accreditation committees have taken a special interest in the teaching of veterinary public health and its relevance to global issues. This forced Australian veterinary schools to take a critical look at their veterinary public health curricula and resulted in the establishment in 2006 of an inter-university network of public health lecturers, involving all schools in Australia and Massey University in New Zealand.

The Public Health University Network in Australia and New Zealand

The Public Health University Network was established in 2006, with the prime aim being to harmonise, but not to dictate, the veterinary public health curricula of the participating universities, and to ensure that their courses were updated to address the increasing global importance of the discipline. As a result, it was decided to develop an 'Australasian veterinary public health philosophy'. This was simple and to the point: 'to develop in our students the professional veterinary skills and knowledge to protect and improve human, animal and environmental health'. This wide-reaching philosophy was further expanded to include consideration of the following themes:

– zoonotic, emerging and food-borne diseases

– the principles of food hygiene

– quality assurance systems; in particular, the hazard analysis critical control point (HACCP) system

– veterinary practice and abattoirs

– animal welfare

– occupational health and safety

– regulatory and trade issues

– food production security

– environmental health and sustainable production

– epidemiology

– risk management, assessment and communication
– biosecurity
– emerging animal diseases.

Zoonotic, emerging and food-borne diseases

These are diseases of global importance and are taught from a universal health perspective, reflecting the position of Australia and New Zealand in the Asian region and globally, and ensuring that Australasian veterinary graduates can travel to all corners of the world to work.

Principles of food hygiene

It is becoming increasingly clear that food safety starts at the farm and that veterinarians working in the agricultural industry have an important role to play in the production of safe food 'from farm to fork'. Veterinary students must understand the factors involved in the transmission of food-borne infectious agents from animals to people and the measures required for the production of safe food.

Quality assurance systems, including the hazard analysis critical control point system

These systems have been developed internationally and the position of Australia and New Zealand as meat-exporting countries, employing many veterinarians in the industry, necessitates the training of veterinary undergraduates in the principles and philosophies of global food safety programmes.

Veterinary practice and abattoirs

Veterinarians are employed in export meat abattoirs to oversee the inspection service in both Australia and New Zealand. The expertise developed in this area results in Australian and New Zealand veterinarians being called upon to advise overseas countries on abattoir hygiene and the production of safe meat.

Animal welfare

As discussed earlier, animal welfare is integral to the veterinary profession, whether working with companion animals or production animals. However, a unique position as major global exporters of meat and live animals has resulted in Australia and New Zealand being world leaders in the field of animal welfare 'from paddock to plate', including on-farm issues, transportation, handling at the abattoir and the stunning and slaughter process.

Occupational health and safety

In addition to the many safety issues affecting veterinarians in their daily activities, the emergence of a number of serious occupational infections, and the expansion of the scope of veterinary medicine to include many exotic species of animals, have resulted in an increasing need to inform and train veterinary students in ways to protect themselves, their staff and their clients. For example, in the last year, two outbreaks in horses of Hendra virus disease, an emerging infectious disease in Australia, have resulted in the deaths of two veterinarians (4, 19).

Regulatory and trade issues

The importance of the trade in meat and livestock to Australia and New Zealand, and thus to the veterinary profession, makes it important that students are exposed to a discussion of the issues that could affect such trade and the need to look outside their own country to understand these issues.

Food production security

Animal protein is a vital part of the diet of people around the world. However, for many reasons, animal production is severely compromised in many regions. Australian and New Zealand veterinary researchers are involved with government and non-government agencies, including the Food and Agriculture Organization of the United Nations, in many countries to address the problems of food security. For this reason, it is vital that a global perspective is maintained in Australasian veterinary curricula.

Environmental health and sustainable production

Veterinarians are increasingly becoming involved in discussions on environmental health and sustainable production; for example, the risks to the environment from the dissemination of animal effluent, the destruction of natural habitats for animal production, the displacement and decline of native animals following habitat destruction and the concomitant increase in emerging diseases caused by the encroachment of humans on new ecological niches. It is vital that a holistic approach to such issues is discussed and debated in the veterinary curriculum.

Epidemiology

While this discipline is important throughout the whole veterinary curriculum, its importance to an understanding of infectious diseases of public health significance and their

investigation and control is substantial and has resulted in integrated epidemiology and public health courses being taught at all Australasian universities.

Risk management, assessment and communication

These disciplines are becoming increasingly important internationally, as the veterinary profession co-operates with other professions to define and manage the risks posed by the increasing world trade in animals and animal products and the parallel emergence of new animal and zoonotic diseases. While these specialist areas are not widely incorporated into the undergraduate veterinary public health curricula, instead usually being taught at the postgraduate level, it is essential that students be exposed to their general principles in relation to global issues of public health importance.

Biosecurity

Together with risk assessment, biosecurity has acquired a high international profile in recent years, for economic and public health reasons, and biosecurity principles are increasingly being applied in all areas of veterinary science. A sound knowledge of these principles is crucial for contemporary veterinary graduates, since the expanding area of biosecurity is a growing source of employment worldwide.

Emerging animal diseases

The field of emerging animal diseases has been thrust into prominence in the Australasian region over the last two decades, as it has in other parts of the world, with a multitude of emerging and re-emerging diseases causing serious problems for animal health, human health and trade and highlighting the knowledge that, in fact, disease knows no boundaries. It can be argued that, while veterinary public health traditionally covers zoonotic disease risks, any disease of food-producing animals constitutes a public health issue, as shown by the number of suicides in farmers following the eradication campaign for FMD in UK cattle (particularly since FMD is a disease of little or no zoonotic importance). Thus, it is important that veterinary graduates understand the effects of emergency animal diseases on the general population, by instilling in students an empathy for the people who own and work with the affected animals and an understanding that animal and human health are intimately related. In fact the two terms have now been superseded by the single term: 'One Health', a concept that was created by Virchow in 1856: 'Between animal and human medicine there is no dividing line – nor should there be'. This philosophy is being used to redefine the effort to control disease worldwide.

The global implications of veterinary public health teaching in Australia

From the preceding discussion, it is clear that Australian universities have an obligation to train students in veterinary public health from a global perspective, as indeed do all universities worldwide. The world has been shrinking for many years now, as Australian citizens (and animals) travel widely and quickly for work, leisure and trade. With the rapid rise of the internet, global health issues can be recognised and responded to immediately, provided resources are available, and veterinarians from Australia have played their part in controlling diseases in many regions. Thus, the veterinary profession is a truly global profession, and it is integral to the success of the 'One Health' concept. No longer is it appropriate or even desirable to just throw up barriers to the outside world and 'bury heads in the sand', in the hope that this will keep diseases that affect animal and human health at bay. Biosecurity begins far beyond official borders and the veterinary profession is ideally positioned to lead the way in controlling disease and suffering, and securing food security throughout the world (6). The creation of a global public health curriculum is a visionary concept, and Australian veterinarians are being trained for leadership roles in the future.

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L'intégration des problématiques de santé publique mondiale et de santé publique vétérinaire dans les programmes d'enseignement vétérinaire : le point de vue de l'Australie

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Résumé
Cet article est consacré à l'intégration des problématiques de santé publique mondiale et de santé publique vétérinaire dans les programmes d'enseignement vétérinaire. En Australie, l'enseignement vétérinaire formel existe depuis plus d'un siècle, mais les vétérinaires jouent un rôle déterminant dans la lutte contre les maladies zoonotiques et transfrontalières depuis bien plus longtemps encore. L'Australie est le premier exportateur de viande rouge et d'animaux vivants au monde. De ce fait, l'un des objectifs primordiaux de l'enseignement vétérinaire en Australie est de qualifier les vétérinaires afin de promouvoir et d'assurer la sécurité sanitaire des aliments et le bien-être animal. Les diplômes vétérinaires australiens sont accrédités et permettent à leurs détenteurs d'exercer à l'étranger, y compris au Royaume-Uni et aux États-Unis d'Amérique ; depuis quelques années les effectifs d'étudiants inscrits dans les écoles vétérinaires australiennes s'internationalisent également. Le programme d'enseignement doit donc être suffisamment complet pour donner aux diplômés les moyens de répondre aux défis de la santé publique vétérinaire dans le monde. Un réseau universitaire de santé publique a été établi dans le but d'harmoniser les programmes d'enseignement de la santé publique vétérinaire dans les différentes écoles vétérinaires du pays et de mettre au point la doctrine australienne en matière de santé publique vétérinaire, face aux problématiques mondiales et au concept « Un monde, une seule santé ». Pour finir, les auteurs tirent quelques conclusions sur les conséquences de l'enseignement de la santé publique vétérinaire en Australie et sur le niveau de préparation des diplômés australiens pour l'exercice de cette profession mondialisée.

Mots-clés
Australie – Bien-être animal – Biosécurité – Mondialisation – Programme d'enseignement – Santé publique vétérinaire – Sécurité sanitaire des aliments – Un monde, une seule santé – Zoonose.

Integración de los temas de salud pública mundial y veterinaria en los planes de estudios veterinarios. El punto de vista de Australia

S.G. Fenwick, L. Robertson & C.R. Wilks

Resumen
Los autores examinan la integración de temas de salud pública mundial y veterinaria en los planes de estudios australianos. La enseñanza oficial de la veterinaria en Australia tiene más de 100 años, y los veterinarios llevan incluso más tiempo cumpliendo una importante función en la lucha contra enfermedades zoonóticas y transfronterizas. Australia es el mayor exportador de carne roja y animales vivos del mundo, cosa que explica el destacado lugar

que ocupan en los planes de estudios veterinarios cuestiones como el fomento y la garantía de la inocuidad de los alimentos o el bienestar de los animales. Al estar convalidados, los títulos de veterinaria permiten a los licenciados australianos ejercer la profesión en muchos otros países, entre ellos el Reino Unido y los Estados Unidos de América. En los últimos años se ha observado una mundialización del alumnado en las facultades de veterinaria australianas. Por ello hace falta un plan de estudios lo bastante amplio como para que los titulados sean capaces de afrontar problemas de salud pública veterinaria en todo el mundo. Con el fin de armonizar los planes de estudios de las distintas facultades con respecto a la salud pública veterinaria y de definir una "filosofía australiana" en la materia, se ha creado una Red Universitaria de Salud Pública, vinculada a temas de dimensión mundial y al concepto de "Un mundo, una salud". Los autores, por último, extraen conclusiones sobre las repercusiones de la enseñanza de la salud pública veterinaria en Australia y la preparación de los licenciados australianos para ejercer una profesión mundializada.

Palabras clave
Australia – Bienestar animal – Inocuidad de los alimentos – Mundialización – Plan de estudios – Salud pública veterinaria – Seguridad biológica – Un mundo, una salud – Zoonosis.

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