

Innovations in veterinary education: the Charles Sturt University programme (Wagga Wagga, Australia)

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Summary

Veterinary education must adapt to the changing demands that veterinary medicine is obligated to meet as it serves the needs of the ever-increasing global society. The world community needs the help of veterinary professionals to produce sufficient amounts of safe food, to control and eradicate the increasingly frequent transboundary transmission of disease, and to improve the health of both man and animals, at a global level as well as locally. In recognition of these mounting responsibilities, especially in the need for veterinarians in rural practice, one key venture in Australia has been the creation of the new veterinary school in Wagga Wagga. This paper describes the School's mission and, in particular, the nature of the new veterinary programme that has been created.

Keywords

Australia – Charles Sturt University – Education programme – Livestock veterinarian – Rural veterinarian – Veterinary Education.

Background

In 2001, the Commonwealth Government of Australia commissioned a review of rural veterinary services to examine the roles and availability of veterinarians in rural areas, to identify Australia's future animal health needs and to establish whether or not rural veterinarians will be able to meet those needs. The Frawley Report (5) was subsequently published in January 2003. The review provided a forum for collecting and documenting the opinions of many veterinarians in rural practice which had, until that time, been dispersed through a range of professional and community publications (1). The Report's author heard from over 50 rural veterinarians and concluded, *inter alia*, that many veterinarians in rural mixed practice were concerned about the future of their practices and that there was, at that time, a shortage in many rural areas of veterinarians with experience in

treating production animals and competence and confidence in dealing with them. The conclusions were consistent with the findings of contemporary studies which identified the short tenure of many graduates in rural practices (6) and the reasons that contributed to an exodus from rural practice of many veterinarians (7).

Notwithstanding those comments, the author of the Report considered that there were already a sufficient number of veterinarians in Australia but recommended that there be a re-assessment of the content of veterinary courses. He recommended that there be an increase in the exposure of undergraduate students to production animal health issues, and that steps be taken to facilitate entry into veterinary courses for applicants who are likely to focus on production animals. This conclusion echoed comments made several years previously in Australia (11) and was also noted in North America (4) and the United Kingdom (2).

This public interest in the future of veterinary education and rural veterinary services coincided with the expansion of the course profile at Charles Sturt University (CSU), a relatively new University founded on a long-established Agricultural College and with campuses in several major regional centres in New South Wales. Wagga Wagga is an inland city of 60,000 people in south-eastern Australia, mid-way between Melbourne and Sydney and approximately 450 km from each. The 1997 introduction of a Bachelor of Pharmacy degree programme, based in the Wagga Wagga campus, had proven to be an outstanding success in terms of providing professional graduates who would choose to work in pharmacies in rural centres. The University had strong evidence from this and other allied health programmes to support its claim to 'train in the country, for the country'.

Governmental approval of a veterinary course at CSU was subsequently sought and granted in December 2003. The course was to be developed with the goal of ensuring that a high proportion of the university's veterinary graduates would work in production animal practice and the livestock industries. This aim was to be achieved by offering students of rural backgrounds the opportunity to study veterinary science and by providing the undergraduates with appropriate training for their intended roles.

Programme philosophy

An Interim Curriculum Committee worked through 2004 to develop the philosophy and policies of the new veterinary course, which were consistent with achievement of its goal. The guiding philosophy is based on the following convictions:

- rural veterinary practice has a future, although it is likely to be different from the current model. Compared to the present conditions, there may be fewer larger practices, and veterinarians in rural practice will need a different skill set to adapt to the changing needs of their livestock clients for professional services;
- the responsibilities of a veterinary school with a focus on the livestock industries must include providing enhanced training for undergraduate and postgraduate students for careers in diagnostic pathobiology, public health and biosecurity, as well as future forms of rural veterinary practice;
- educational approaches must meet the needs of graduates of the future. The expansion of global veterinary knowledge is now so rapid that the emphasis during the veterinary course must shift away from the memorisation of fact (just-in-case knowledge) towards the development

of learning, analytical and clinical reasoning skills (just-in-time knowledge).

Policies directed at achieving the goal of the programme include a broadening of the criteria for selection into the programme, a strong practical component and comprehensive training in areas considered important for rural practice of the future. The decision to deliver the course in a rural centre, remote from major cities but embedded in an agricultural region, was also considered fundamentally important, but was not in the scope of decisions to be made by the Interim Curriculum Committee. Of these characteristics of the CSU course, the adoption of a broad-based student selection process is possibly the most important.

The course itself is a six-year double-degree programme. Students can enter directly from secondary school (aged 17 or 18) or at any time later. The programme is divided into three phases. Phase 1 is the first two and a half years of the course and delivers the pre-clinical content with traditional lectures and practical classes. Phase 2 is two years in duration and the learning modality switches to problem-based learning, supported by practical classes, intramural clinical rotations and information sessions. Phase 3 is the last one and a half years of the course, which consist principally of 10 rotations, each of three weeks duration, in a range of veterinary clinical, non-clinical and laboratory workplaces. The first students enrolled in 2005 and will graduate in 2010.

Student selection

The designers of the CSU veterinary programme took the view that some of the factors which are likely to contribute to the low retention rates of veterinarians in rural practice are associated with the graduates' backgrounds and their life experiences; specifically:

- their knowledge of, and intrinsic interest in animal production
- their experience of establishing personally satisfying lives in rural communities
- their ability to identify with the business objectives of their clients
- their ability to communicate with their clients and their colleagues.

Consequently, a selection process was developed which requires applicants to demonstrate, through a written application and an interview, a strong natural interest in, and an understanding of, the activities that take place in animal production, and experience of one or more types of animal production systems. In addition, successful

applicants are expected to demonstrate that they have a realistic view of veterinary roles in animal production and public health and have an expectation that a career in veterinary science is much more than romantic images seen on television or imagined through limited interactions with their local veterinarian.

To be successful, applicants must also demonstrate that they have sufficient academic abilities to study and complete the veterinary course. While it is common for entrants into the metropolitan veterinary schools in Australia to be ranked in the top 2% of the state's student body at the end of their secondary education (or the equivalent from tertiary studies), the requirement for entrance into the CSU course is that students must fall in the top 10% of school leavers (or equivalent).

Curriculum

Development of practical skills

There is emphasis during the course on the early development of practical skills, including animal handling and veterinary procedures commonly performed with large animals (per-rectal pregnancy diagnosis and artificial insemination of the bovine, oral examinations, dental floating and passing of a naso-gastric tube in the equine, venipuncture for blood collection in multiple species, etc.).

The early introduction of instruction in these skills was intended to stimulate learning of theoretical studies by providing a relevant practical context and to encourage students to practise off campus and to develop skills by taking opportunities that might arise while completing the rest of the course. The School's approach to animal handling instruction has been described in detail elsewhere (3). An unintended additional benefit has been that veterinarians who accept these students for clinical placements are more likely to allow the students to participate actively in some procedures because they already have some dexterity (i.e. speed) in performing them.

Students are also involved in rural veterinary practice from Year 1. While placements in practices are not considered to be 'clinical' training until the end of the third year of study, CSU students have already completed a total of 22 days in at least seven different practices before reaching that point in the course. Placements are initially of one day only (in Years 1 and 2) then five consecutive days on two occasions in Year 3. Each placement has specific, identified objectives for student learning and is followed by a de-briefing session. These pre-clinical placements are intended to develop each student's animal handling skills (particularly with small animals) and to increase their understanding of the veterinary profession, of the practice as a workplace

and a business and of the role of veterinary practitioners in their communities. They are also a powerful stimulus to on-campus learning.

Development of communication skills

The types of communication skills targeted include written skills, presentation skills and conversational skills. The latter are taught by means of training and practice, through role plays and in client consultations. The course covers the development of verbal and non-verbal communication, history taking, empathic listening, achievement of client compliance and dealing with anger, grief and ethical dilemmas. Training commences in the first year of the course and is repeated in three subsequent years, using purpose-built facilities which include a mock consulting room with a one-way glass wall for students to observe their peers and with video and audio recording and playback facilities.

Development of appropriate knowledge

The curriculum is strong in content relevant to production animal practice. The first year of the course provides clear indication of the balanced tone of the course, with epidemiology, economics, pasture agronomy and quantitative genetics set alongside the basic sciences of chemistry and biology. The course is longer, at six years, than most other veterinary courses in Australia, although three other courses in Australian Universities now (or soon will) require a total of at least six years of tertiary study before graduation. The extra length leaves more time for the study of nutrition and animal production and for the completion of a substantial project in the fourth and fifth years of the course. The project involves a study of an animal population (usually a farm) from an epidemiological and business-oriented approach.

Development of professional knowledge and attitudes

Students are exposed during the curriculum to the many important roles filled by veterinarians who work in non-clinical settings. They examine the issues confronting veterinarians working in regulatory, policy development and state medicine roles and all students in the senior year have placements in non-clinical workplaces.

Development of problem-solving skills in a student-centred curriculum

Development of theoretical knowledge in the second phase of the programme is achieved through a problem-based learning (PBL) curriculum. Lectures, which form the basis

for content delivery in Phase 1, are almost totally replaced by a series of 48 cases or packages delivered through staff-facilitated PBL sessions at the approximate rate of one per week. The packages are designed to facilitate learning across the para-clinical and clinical disciplines and across a range of domains related to the programme's graduate attributes. The packages are grouped under four major organisational units – Companion Animals, Farm Animals, Population Medicine, Public Health and Biosecurity. The manner in which PBL is used in the School is well aligned with the philosophy described recently by Lane (10), with the exception that the challenge of providing sufficient staff resource for facilitation is addressed by facilitating four groups of seven or eight students simultaneously. For a programme like ours with up to 60 undergraduate students in each class, facilitating in this fashion allows the PBL programme to use core academic staff for facilitation but still requires no more staff time than a traditional, lecture-based programme.

Workplace experiences

The curriculum includes all of the extramural industry and clinical placements required by the accreditation bodies, plus a few more. In addition to their placements in abattoirs, diagnostic laboratories and clinical settings in the second and third phases of the course, students are required to complete 12 weeks of animal husbandry extramural studies on farms (horse, beef, dairy, sheep, pig, and poultry experiences are all required) during the first two and a half years of the course. The workplace experiences contribute to the development of important skills, knowledge and attitudes by closely involving the student in animal handling, decisions about animal health, production and food safety, and the development of interpersonal skills with members of the communities involved in animal production and veterinary services.

An important consequence of offering a veterinary programme in the centre of a large agricultural district is that students spend all semester and much of their vacation time in rural areas, retaining their familiarity with the ways in which rural communities function, and maintaining their friendships and social bonds amongst other rural dwellers. Most students seek paid employment during vacation times, and in most cases the employment is in rural centres. These experiences deepen the bond that CSU graduates will feel with rural communities on graduation and the ease with which they will establish their post-graduation lives in similar communities.

Additional innovations

Establishment of a veterinary school in a regional centre of moderate size provides challenges which are different from

those faced by schools in large cities. One of these challenges is to provide clinical training without competing for clients with existing practices. Universities may be seen as unfair competition for first-opinion practice and the likely case-load for referral practice may be too small to provide satisfactory training opportunities for students without the support of a busy first-opinion practice.

One option for CSU was to buy one or more local veterinary practices and operate them as veterinary teaching hospitals. Another option, and one which we have taken with respect to small animal practice, is to enter into an arrangement with a local practice such that the practice continues to be operated by its private enterprise owners but university clinicians and students participate in the clinical operation. There is a clear separation of the business operation from the clinical training. The University is not involved in the business, and is therefore not responsible for the employment of associates, nurses and other staff, or for purchasing and drug sales, duty rosters or after-hours services (except as participants when it is educationally useful to do so). CSU clinicians are not expected to meet any income generating targets on behalf of the practice, so have significant freedom in the way in which they may choose to allocate time to any one particular case or case discussion. The benefit for the owners of the clinic is the access that is provided to the special interests and knowledge of the university clinicians and their contribution to an overt intellectual culture in the practice, which also makes the practice a particularly attractive option for early career veterinarians.

Interestingly, the location of the veterinary programme in a regional centre is proving to be of advantage in attracting a referral base which is relevant to undergraduate training. While in the developmental stages it was expected that equine and small animal referrals would be low in number, that is proving not to be the case. Furthermore, with no private enterprise specialist centres within 200 km, referrals to the School's teaching hospitals from within the region are generally the types of cases which are commonly referred or managed without referral in some metropolitan practices. Such cases make excellent cases for clinical instruction and the development of clinical reasoning skills in undergraduates. In fact, it may be that the balance of first-opinion and secondary referrals provided to our students is of greater relevance for undergraduate instruction than the predominantly high-level referrals seen at metropolitan veterinary schools.

Research training

Training in research methodology is fundamental to sound training in any field of science. The CSU School has

developed an integrated Honours programme which is offered to those students who complete the first four years of the course with high academic grades. The research project which contributes to the award of Honours is completed in the second half of the fifth year, or the first half of the sixth year. The research project takes the place of two of the ten Phase 3 clinical rotations which are undertaken by students completing the Pass degree (without Honours) in the last year of the programme. The research programme follows closely on from a period of training in research methods completed by all students and is part of a theme of developing research method awareness which runs throughout the curriculum. It is anticipated that about one third of all students will be eligible for, and elect to complete, an Honours project. It is intended that the research projects will encourage some graduates to enrol in PhD programmes soon after graduation – although we recognise that veterinary graduates usually prefer to initially enter practice rather than research programmes.

Challenges

The siting of a veterinary programme in a region that is a long way from a metropolitan centre may bring advantages for the life experiences of the undergraduates and exposure to production animal practice, but it also brings the challenge of attracting specialist academic and technical staff, particularly in a country as highly urbanised as Australia. This is clearly the case for veterinary specialists in disciplines which service predominantly companion animals and who require high population densities to support their practices.

Our approach has been to consider carefully the desired contribution of each of the specialist disciplines to the core curriculum of the programme. Not every specialist discipline needs to be represented amongst the staff of an undergraduate programme. In the case of those disciplines for which staff representation is deemed to be essential, all efforts are made to recruit specialists onto staff or to bring specialists into the programme for periods of contracted teaching.

In the case of specialist disciplines for which a full-time appointment is not considered essential, relationships with specialist centres or teaching hospitals in other schools in metropolitan areas can be made such that students receive appropriate experience and instruction while on clinical rotation.

Results

The first students commenced study in the veterinary programme in 2005 and are currently in Year 5. A survey

of those students and of Australian resident students entering the established programme at the University of Sydney was conducted in early 2005 (8). The student groups were significantly different in a number of criteria reflecting their backgrounds and life experiences. More CSU students than Sydney students had grown up on farms or in country towns (79% vs 17%); more CSU students had been solely or partly responsible for more than five farm animals (67% vs 10%), more than five horses (36% vs 15%) and more than five dogs or cats (40% vs 22%).

Students entering the veterinary programme at the University of Sydney had, on average, a higher score from their secondary school studies and the average educational level of their parents was higher than those from CSU.

Students were asked to predict the type of work they would wish to perform after graduation. The two student groups stated similar levels of interest in working with horses, but 9% of Sydney students and 69% of CSU students expected to work in a practice seeing substantial numbers of cattle or sheep in their first year. With respect to working in small animal practice, 42% of Sydney students but no CSU students expressed an intention to do so.

It is likely that the expressed views of the CSU commencing students were influenced by the stated objectives of the course, which indicated that the training would be more directed to farm animal practice than small animal practice. It is interesting therefore to note the answers given by the same cohort of CSU students when asked in 2008 to select an option for a final year elective rotation. Options included spending an additional placement in an equine, dairy or small animal practice, or completing a placement in a livestock industry consulting practice (dairy, sheep, pig or aquaculture). The number of choices varied between Honours (1 choice) and Pass-degree (2 choices) students, but there were in total 42 choices made by the 30 students in the class. Only two students (5% of choices) elected additional small animal practice; 31% of choices were for livestock consulting practice; 29% were for a reproduction (mixed species) rotation; 14% were for additional dairy placements; and 10% for additional equine placements. The reader could justifiably wonder if there has simply been inadequate experience of small animal practice during the course. We contend that this is not the case – the small animal curriculum meets accreditation standards – but it remains to be seen if this preference for practice work with large animal species is continued after graduation. The study of undergraduate preferences and interests, and of graduate destinations, will continue.

Feedback from practitioners

Students now entering the senior years of the course have completed part of their clinical extramural studies in veterinary practices in Australia and overseas. Feedback from practitioners who have hosted students has been strongly positive, with frequent mention of the relatively strong communication skills and animal handling skills of the CSU students. While the data are uncontrolled, most practitioners involved have experience of students from other schools, which has lent some weight to the value of the comments.

Discussion

Many new veterinary graduates in Australia enter rural practice but most of them leave and take up positions in metropolitan centres within the first five years of employment (9). Many factors contribute to the decisions of early career veterinarians to leave rural practice and undoubtedly some of these factors are related to low incomes and long work hours – factors which are largely (but not entirely) unrelated to the quality or nature of the education the graduates receive in veterinary school.

The development of the CSU veterinary programme has sought to address the difficulties of rural practitioners in attracting and retaining veterinarians. The School recognises that the difficulties in attracting veterinarians apply to positions with companion animals as well as farm animals and that companion animal practice is of very significant financial importance in most rural practices.

The approach the School has taken is untested but logical. Most students entering veterinary schools in Australia before 2005 were from urban backgrounds and many of those who were of rural background had attended metropolitan schools as resident students (6, 8). Selection criteria were dominated by the academic achievement of

the students at secondary school or university study in other courses. The notion of selecting a more diversified student group, with broader interests, including a positive disposition towards farm animals and a rural lifestyle, based on experience, seemed compelling to many concerned about the decline in student interest in production animals and was one recommendation from the Frawley Review (5).

The curricular innovations at CSU are also untested but there is good evidence that experience and confidence with large animals – both handling them and relating to their owners – will encourage graduates to enter rural practice and gain professional satisfaction from it (6). The same view (that acquisition of animal-handling skills influences career choice) was recently expressed by students from a metropolitan-based veterinary school (12).

The development of non-technical skills – communication and business skills particularly – and the ability to adapt to rural life are also key aims of the CSU veterinary programme. These two traits were identified, in a survey of rural practitioners, as the most important qualities for a veterinarian in rural practice (7).

It remains to be seen what the outcome of the approach taken at CSU will be, but early indications are that the student body is significantly different in background, interests and career plans from those at other Australian universities. Experience of the outcomes of the programme and knowledge of the graduates' careers over the next 5, 10 and 20 years will provide compelling information for the profession as it deals with the challenges of adapting to the needs of society in the 21st Century. ■

Les innovations dans l'enseignement vétérinaire : le programme de l'Université Charles Sturt (Wagga Wagga, Australie)

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Résumé

L'enseignement vétérinaire doit s'adapter aux mutations croissantes que la mondialisation de la société impose à la médecine vétérinaire, laquelle doit désormais satisfaire à de nouvelles exigences. Les principales questions auxquels les futurs vétérinaires devront faire face concernent la nécessité de produire des denrées alimentaires exemptes de risque et en quantité suffisante, la maîtrise et l'éradication de maladies dont la transmission transfrontalière s'avère de plus en plus fréquente, et la mise en place d'orientations permettant d'améliorer la santé animale et la santé publique au plan local aussi bien que mondial. L'une des initiatives majeures entreprises en Australie pour développer les compétences requises par cette évolution, en particulier dans le cadre actuel de pénurie de vétérinaires d'exercice rural, a été la création de la nouvelle Faculté de médecine vétérinaire à Wagga Wagga. L'auteur décrit cette initiative et présente le contenu du nouveau programme d'enseignement vétérinaire créé à cet effet.

Mots-clés

Australie – Enseignement vétérinaire – Programme d'enseignement – Université Charles Sturt – Vétérinaire d'exercice rural – Vétérinaire pour les animaux de rente.



Innovaciones en la formación veterinaria: el plan de estudios de la Universidad Charles Sturt (Wagga Wagga, Australia)

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Resumen

Los veterinarios atienden las exigencias de una sociedad cada vez más mundializada; por consiguiente, su formación debe adaptarse a sus cambiantes exigencias. Se trata, en particular, de producir cantidades suficientes de alimentos inocuos; de contener y erradicar la creciente propagación de enfermedades a través de las fronteras, así como de prestar asesoramiento para mejorar la salud pública y la sanidad animal, tanto a escala mundial, como local. Los planes de estudios de la nueva escuela veterinaria creada en Wagga Wagga, Australia, contemplan esas crecientes responsabilidades y, en particular, la necesidad de formar veterinarios que ejerzan en zonas rurales. En este artículo se presentan los objetivos y, en particular, las características del nuevo plan de estudios de medicina veterinaria de esa institución.

Palabras clave

Australia – Formación veterinaria – Plan de estudios – Universidad Charles Sturt – Veterinario de animales de granja – Veterinario rural.



References

1. Anon. (1996). – Employee drought hits rural practice. *Aust. vet. J.*, **76**, 186.
 2. Anon. (2003). – Concerns raised over availability of large animal veterinary surgeons. *Vet. Rec.*, **153** (18), 542-543.
 3. Austin H.E., Hyams J.H. & Abbott K.A. (2007). – Training in animal handling for veterinary students at Charles Sturt University, Australia. *J. vet. med. Educ.*, **34** (5), 566-575.
 4. Elmore R.G. (2003). – Recruitment and retention of veterinary students for food animal practices. *J. Am. vet. med. Assoc.*, **222**, 1697-1699.
 5. Frawley P.T. (2003). – Review of rural veterinary services: report. Published by the Department of Agriculture, Fisheries and Forestry and the Department of Education, Science and Training, Australia.
 6. Heath T.J. (1998). – Longitudinal study of career plans and directions of veterinary students and recent graduates during the first five years after graduation. *Aust. vet. J.*, **76**, 181-186.
 7. Heath T.J. (2008). – Number, distribution and concentration of Australian veterinarians in 2006, compared with 1981, 1991 and 2001. *Aust. vet. J.*, **86**, 283-289.
 8. Heath T.J., Hyams J., Baguley J. & Abbott K.A. (2006). – Effect of different methods of selection on the background, attitudes and career plans of first year veterinary students. *Aust. vet. J.*, **84**, 217-222.
 9. Heath T.J. & Niethe G.E. (2001). – Veterinary practitioners in rural Australia: a national survey. *Aust. vet. J.*, **79**, 464-469.
 10. Lane E. (2008). – Problem-based learning in veterinary education. *J. vet. med. Educ.*, **35**, 631-635.
 11. Lean I.J. (1998). – Food animal veterinary medicine: where to and why? *Aust. vet. J.*, **76**, 608-609.
 12. White P. & Chapman S. (2007). – Two students' reflections on their training in animal handling at the University of Sydney. *J. vet. med. Educ.*, **34** (5), 598-599.
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