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Mapping farm animal welfare education at university level in Europe

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Abstract

The aim of this study was to map farm animal welfare university education in an enlarged Europe with emphasis on identifying existing differences and gaps. Information on 210 courses dealing with farm animal welfare from 98 universities in 26 European countries were obtained. Statistical analysis was carried out on 155 of these courses within animal science or veterinary programmes, at Bachelor and Master level and with the countries grouped into five regions (North West Europe, Mediterranean, West Central Europe, East Central Europe and Balkans). There were significantly more hours of teaching in animal welfare in the North West region of Europe. This region also had more 'interactive' education methods, eg group discussion and farm visits, whereas West Central Europe had most 'transmissive' methods, eg lecturing. A course was more likely to be given in English in North West Europe (even when the UK and the Republic of Ireland were excluded from the analysis) and East Central Europe compared to West Central Europe and the Balkans. There appeared to be no regional differences in the content of the courses although the focus was significantly more 'applied', ie towards welfare assessment and legislation in the veterinary education and more 'fundamental', ie oriented towards ethology, physiology and ethics, in the animal science education. In summary, the main differences in farm animal welfare education across Europe seem to be in the reduced number of hours of education, less interactive teaching and fewer courses in English available to students outside the North West region.

Keywords: *animal science, animal welfare, Europe, farm animals, university education, veterinary medicine*

Introduction

There are an increasing number of courses completely or partly dedicated to farm animal welfare within European university education. Up until now most of the research into education on animal welfare has been directed to *what* and *how* it should be taught (Lord & Walker 2009; Molento & Calderon 2009; Main 2010; Abood & Siegford 2012). These studies are important because the science of animal welfare is inextricably linked to values (Fraser 1995) and the approach and content of courses dealing with animal welfare may influence later attitudes and perspectives towards the subject (Paul & Podberscek 2000; Clark 2010; Hazel *et al* 2011). This paper, however, also addresses *where* it is taught, which up until now has been rather neglected because of the obvious difficulties of locating all the different courses. There have been surveys focusing solely on teaching in animal welfare in veterinary programmes; eg investigating 16 veterinary schools worldwide (Hewson *et al* 2005) and 43 veterinary schools in Europe (Briyne 2011) or focusing on postgraduate teaching (Lund 1997). A large-scale survey focusing on animal welfare education, irrespective of the programme in which it is taught, has not been attempted before.

Phillips *et al* (2012) recently concluded there are significant regional and national differences in attitudes to the welfare and rights of animals. That study involved students from eleven European and Asian countries. Differences in societal attitudes and awareness of animal welfare issues across Europe have also already been well documented (Evans & Miele 2007, 2008). Given these differences in

attitudes to animal welfare in general, it was strongly suspected that there would be differences in attitudes to teaching animal welfare. That is to say, the priority given to education in this subject would vary between countries and this would be reflected in the duration of the courses that are completely or partly dedicated to farm animal welfare throughout Europe. That education in animal welfare has been lagging behind in some regions, affects both the quality and interest in the research in animal welfare, as well as the awareness among stakeholder representatives of the importance of animal welfare issues. One might also expect that given previously identified differences in attitudes, the content of the courses might also vary between countries. For instance, the fundamental scientific basis of animal welfare, such as physiology and ethology, may be more strongly present in countries that have a long tradition of animal welfare research, whereas in countries that implement EU animal welfare policies but do not participate so strongly in research, more applied aspects such as legal issues and/or animal welfare assessment may prevail.

Given the anticipated differences in farm animal welfare teaching between European countries, this study also focused on opportunities for student mobility. The Bologna process, implemented in 1999 (Bologna Declaration 1999), increased student mobility and employability based on easily readable programmes and degrees. Throughout Europe, the undergraduate/postgraduate degree structure has been modified into a three-cycle system at Bachelor (BSc), Master (MSc) and Doctoral (PhD) levels. The widespread use of the ECTS (European Credit Transfer and Accumulation System) has the additional benefit of making studies, such as the one reported in this paper comparing education across different European countries, more reliable than even a few years ago.

The aim of this study was to map farm animal welfare university education in Europe to identify existing differences and gaps. It was part of the EU-funded project AWARE (Animal WelfAre Research in an enlarged Europe, KBBE-265686) which has the aim to promote integration and increase the impact of European research on farm animal welfare, hence the focus on farm animals and on Bachelor, Master and PhD level courses. The intention was to provide information upon which to make recommendations on how to improve veterinary and animal science education to better promote animal health and welfare and to enhance the opportunities for young scientists in new and candidate EU countries to start research careers in farm animal welfare, or to integrate animal welfare aspects into their research.

Although the questionnaire was of a mainly explorative nature, dealing with the intensity and focus of the different farm animal welfare courses as well as the possibilities for student exchange, we also tested some other hypotheses. These were based on earlier experience of differences in animal welfare education between the older (North and West) European member states and the newer (Eastern) member and candidate member states (Briyne 2011). We predicted more teaching dedicated to farm animal welfare and a greater proportion of obligatory farm animal welfare courses in the older member states compared to the newer ones. We also predicted a higher proportion of teaching related to implementation of animal welfare legislation, rather than basic discipline-oriented teaching, in the newer member states and that this teaching would take a more traditional form, ie involve more lecturing and less group discussion.

Materials and methods

Mapping of education

Mapping farm animal welfare (FAW) courses was done using a web-based questionnaire (created using the forms in Google Docs), which was distributed using a hub network structure of contacts within the AWARE network (Figure 1). Initially, all European countries were allocated to one of eight geographical regions and one educational establishment well acquainted with FAW academic activities in each region was recruited as 'hub leader'. This hub leader served as the central point in the collection of data for that region. A short initial survey was distributed by hub leaders to universities and research institutes in the region who were already engaged in, or who might be considering initiating, research or education in farm animal welfare. Using a snowball sampling approach (Goodman 1961), additional contacts were also identified by the respondents of the initial survey. Following this first survey, the internet link to the larger education questionnaire was sent electronically to lecturers in a total of 163 universities and colleges in 36 countries. The questionnaire was available on the AWARE project website between September 2011 and June 2012. Both surveys were in English, given that the target responders were university academics used to reading English. To reduce the risk of language barriers, the questions in the questionnaire were formulated as simply as possible and they were cross-checked in a pilot version by hub leaders from all regions. A maximum of two reminders were sent to non-respondents.

The questionnaire consisted of introductory information, three background questions (name, surname and email contact of the respondent), 17 questions to be answered about each course, followed by six questions about future plans. The results presented in this paper are based on eleven questions from the full questionnaire and the exact wording of these questions is presented in Table 1. The full questionnaire is available on request.

Data selection for the statistical analysis

Before analyses started, the 26 countries from which responses were received were re-grouped into five new regions, still corresponding to their geographical distribution in Europe (Table 2). The Nordic countries were included in the North Western part of Europe because of similar cultural and research tradition in farm animal welfare issues. The Baltic region was removed from the analysis because only two FAW courses were mapped. Furthermore, data on 55 courses were removed from the data set due to the low number of FAW courses in those programmes (eg philosophy and economics) and at the PhD

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Figure 1

Hub structure used for the survey.

level. Thus, only courses where the overall programme was either veterinary medicine or animal science (including agriculture) taught at BSc and MSc level were included in the statistical analysis. This meant that from the 210 mapped courses, 155 were analysed.

In addition to analyses of the individual questions according to the original response categories in the questionnaire, two indexes were calculated to more easily present key issues. These were a 'fundamental' focus index, reflecting the subjects addressed in the course, and an 'interactive teaching' index, reflecting the teaching methods used.

The 'fundamental' focus index was used to analyse the focus of an FAW course since animal welfare is a broad topic and courses can be expected to emphasise different areas or welfare issues. The topics within each course were categorised as being either 'fundamental' or 'applied'. Applied topics included welfare assessment and legal issues of farm animal welfare, while fundamental topics included ethology, stress physiology and ethics and so were more focused on underlying principles. The 'fundamental' focus index was then calculated for every course as the number of hours of fundamental topics divided by the number of the hours of both fundamental and applied topics. The index was between zero and one, where a higher index indicates more fundamentally orientated teaching.

The 'interactive' teaching index was used to analyse the teaching methods of an FAW course since there are many different approaches that can be used when teaching a subject. Teaching methods were summarised as being either 'interactive' or 'transmissive'. Transmissive teaching included lecturing and describing case studies, whereas interactive teaching included group discussion, on-farm demonstration and practical exercises involving more active communication with the students. The 'interactive' teaching index was then calculated for every course as the number of hours of 'interactive' teaching methods divided by the number of both 'interactive' and 'transmissive' teaching methods. The calculated index was between zero and one, where a higher index indicates more interactive teaching.

All data were analysed using SAS (SAS Inst Inc, Cary, NC, USA; version 9.2). Results were considered statistically significant when $P \leq 0.05$. Only significant results are presented. Three explanatory variables were included as categorical variables in all models: REGION (North West Europe, Mediterranean, West Central Europe, East Central Europe and Balkans), OVERALL PROGRAMME (veterinary medicine and animal science) and EDUCATION LEVEL (BSc and MSc).

There were four continuous dependent variables: the hours of FAW teaching, the number of ECTS points associated with the course, the 'fundamental' focus index and the 'interactive' teaching index. First, data were inspected using histograms, scatterplots, boxplots, summary statistics etc. The distribution of all variables was skewed (as controlled

Table 1 List of questions from the original questionnaire on which the results are based on.

Questions of the teaching intensity and focus of the course
• What is the approximate number of enrolled students attending this course each year?
• How many hours of the whole course encompass farm animal welfare (one teaching hour equals 45 min)?
• What percentage of teaching (of the whole course) includes farm animal welfare?
• Is the course for students as a subject obligatory or optional?
• What is the main focus of the farm animal welfare part of the course and what is the approximate percentage of this focus? Applied ethology, basic ethology, stress physiology, legal issues of farm animal welfare, animal ethics, other
• What are the main teaching methods encompassing farm animal welfare? Lecturing, case studies, group discussion on-farm demonstrations, practical exercise (requires active involvement of the student), other
Questions important for students' exchange
• Is the course provided in English?
• For how many ECTS (European Credit Transfer System) is this course evaluated?
• Is your course open for students from abroad?
• Is the teaching of farm animal welfare taught as a block (ie several days in a row)? If 'Yes' click 'Other' and specify for how many days
• Would you be willing in the future to share some of your teaching materials?

Table 2 Allocation of countries and number of FAW courses in the overall programme veterinary medicine and animal science in each of the five regions as used for statistical analysis.

Region	Country	Number of veterinary medicine courses	Number of animal science courses	Number of FAW courses in total
North West Europe	Belgium, Denmark, Finland, Republic of Ireland, The Netherlands, Norway, UK, Sweden	15	34	49
Mediterranean	France, Italy, Spain	8	17	25
West Central Europe	Austria, Germany, Switzerland	7	14	21
East Central Europe	Czech Republic, Hungary, Poland, Slovakia	7	27	34
Balkans	Bulgaria, Croatia, Greece, Macedonia, Romania, Serbia, Slovenia, Turkey	16	10	26
Total		**53**	**102**	**155**

by histograms) and data were thus transformed using natural logarithms to achieve normality. An ANOVA model (PROC GLM) was applied to test the question of whether the variables differed between regions, overall programmes and education levels. In the case of a significant effect of REGION, pair-wise differences between the regions were assessed using the Tukey correction.

Logistic regression models (PROC GENMOD) were applied for all questions with a binary data outcome (yes/no): obligatory FAW course, open for students from other countries/regions, taught as a block and percentage of FAW teaching in the course (whether each hour of the course dealt with FAW or not). For the dependent variable percentage of FAW teaching, the length of the course (hours taught) was added as an extra explanatory factor to the model. The UK and the Republic of Ireland were excluded from the REGION 'North West' for the question whether an FAW course was given in English because their native language is English.

Results

Replies were received from 98 (60%) of the 163 universities and colleges approached; obtained from 26 of the original 36 countries surveyed. These 98 replies covered a total of 210 (range one to 14) courses dealing completely or partly with farm animal welfare. Of the 210 courses reported, 100 Bachelor courses, 89 Masters courses and 13 PhD courses were described in the responses. The dataset also comprised five professional/further education courses and three other courses. In total, the courses were attended by approximately 9,100 students per year. The most frequent types of courses in the veterinary medicine programme were animal welfare and animal health, while in the animal science programme, courses focused mainly on ethology, animal husbandry and physiology. An examination of the number of teaching hours of FAW showed that only 25 courses (11.9%) were dedicated entirely to FAW. On average about 40% of the course dealt with FAW, with a

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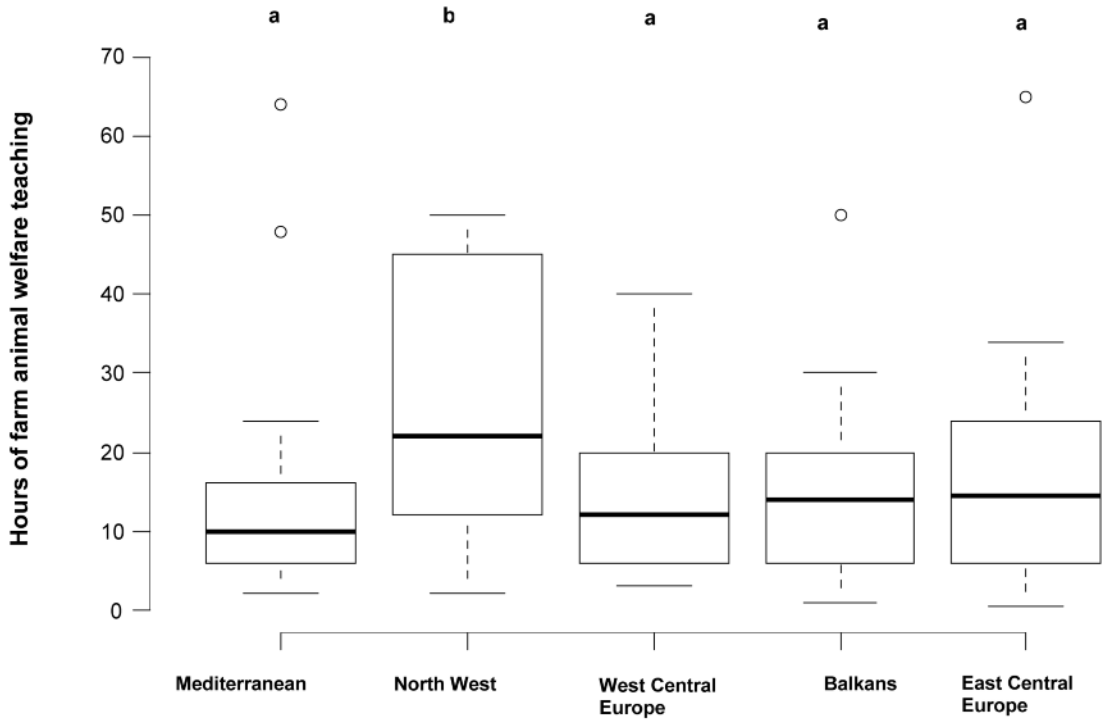
Figure 2



Boxplot showing hours of FAW teaching per course in the five regions (median, first and third quartile, minimum and maximum). Some outliers are out of the range of the figure. Different letters indicate significant differences between REGIONS ($P < 0.05$).

wide range from a few percent to 100%. In terms of teaching hours specifically devoted to FAW, the courses varied between two and 120 h, although only 25% of the courses have more than 26 h of FAW teaching. The distribution of courses per region is shown in Table 2, however, the statistical differences below are presented on a per course basis to account for variation in the size of the regions and the number of universities in each country.

Teaching intensity and focus of the course

The hours of FAW teaching within a course was significantly influenced by the REGION ($F_{4,146} = 4.6$, $P = 0.002$). The North West region had significantly more hours of FAW teaching within a course compared to the other regions. The untransformed hours of FAW teaching per course are shown in Figure 2.

The proportion of FAW teaching within a course was significantly influenced by the REGION ($\chi^2_4 = 296$, $P < 0.001$), by the EDUCATION LEVEL ($\chi^2_1 = 237$, $P < 0.001$) and by the length of the course ($\chi^2_1 = 438$, $P < 0.001$). The North West region had a significantly higher proportion of hours of FAW teaching within a course followed by the West Central region, compared to the other regions. There was a higher proportion of hours of FAW teaching at MSc level compared to BSc level (44.6 [± 0.03] vs 27.9 [± 0.04]%, LS means [± SEM]). Longer courses had lower proportions of FAW teaching (Figure 3).

The 'fundamental' focus index of an FAW course was significantly influenced by the OVERALL PROGRAMME ($F_{1,145} = 4.39$, $P = 0.038$). This index was significantly higher for animal science (0.67) than for veterinary medicine (0.57) which indicates a more fundamentally oriented teaching in animal science programmes.

The 'interactive' teaching index was significantly influenced by the REGION ($F_{4,147} = 2.92$, $P = 0.023$; Figure 4) and the EDUCATION LEVEL ($F_{1,147} = 5.58$, $P = 0.020$). In *post hoc* Tukey comparisons, the North West region had the highest level of interactive teaching (0.40) and this differed significantly from the West Central region (0.23). Courses at MSc level (0.34) had a significantly higher proportion of interactive teaching than those at BSc level (0.26).

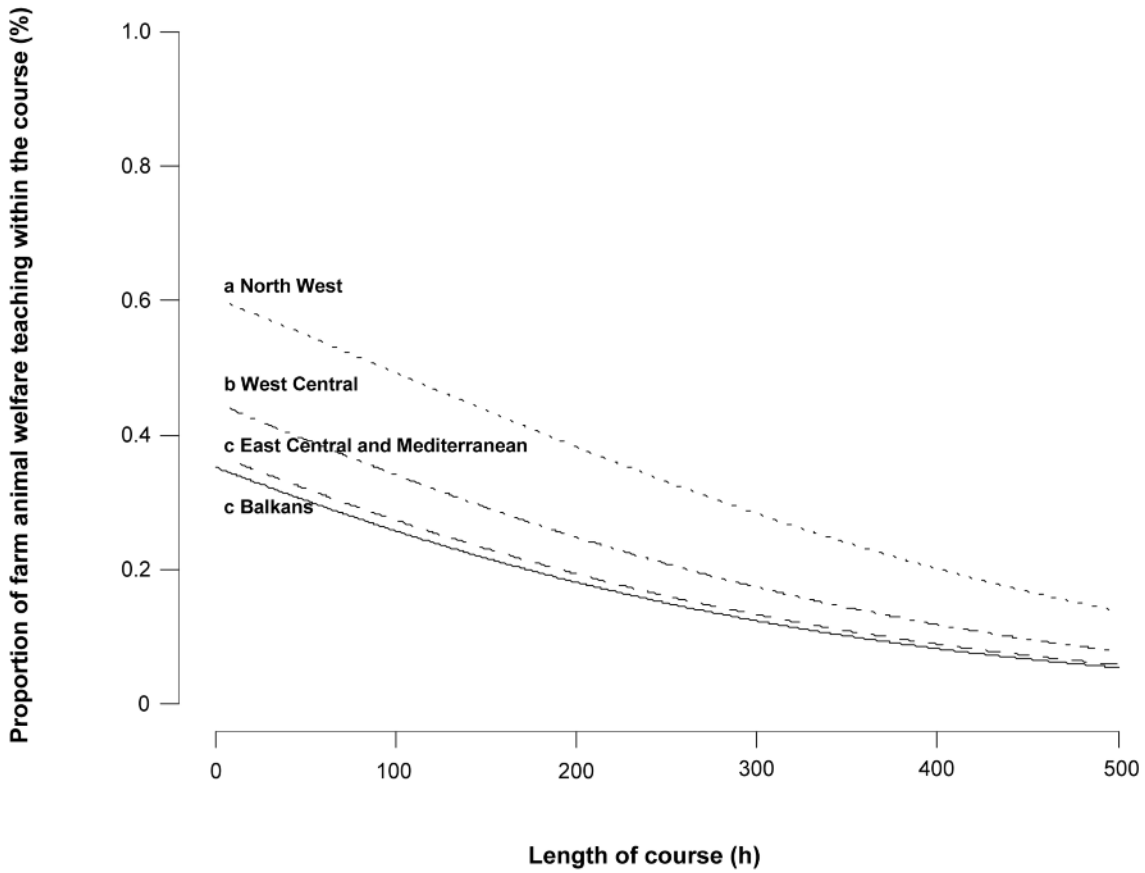
The probability that an FAW course was obligatory or optional was significantly influenced by the OVERALL PROGRAMME and the EDUCATION LEVEL. More courses were obligatory in veterinary medicine than in animal science ($\chi^2_1 = 9.1$, $P = 0.003$, 85 vs 63%) and at BSc level compared to MSc level ($\chi^2_1 = 11.6$, $P < 0.001$, 86 vs 62%).

Information related to student mobility

The probability that an FAW course was open for students from other countries/regions was significantly influenced only by the EDUCATION LEVEL ($\chi^2_1 = 4.3$, $P < 0.001$). Although the majority of courses were open, a higher proportion of MSc courses than BSc courses was open for students from other countries/regions (93.8 vs 83.9%).

The probability of a course being given in English was influenced by the REGION ($\chi^2 = 16.5$, $P = 0.003$) and the EDUCATION LEVEL ($\chi^2_1 = 20.4$, $P < 0.001$). The propor-

Figure 3



The proportion of FAW teaching within a course in the five regions. The solid line belongs to Balkans, the dashed line to the East Central and Mediterranean regions (one line for both regions), the dot-and-dash line to the West Central region and the dotted line to the North West region. Different letters indicate significant differences between REGION ($P < 0.05$).

tion of FAW courses in English was highest in the North West (24.5%) and in East Central Europe (17.0%) even when the UK and Republic of Ireland (where English is the native language) were excluded from analysis. Both regions differed significantly from the Balkans (2.4%) and West Central Europe (1.4%). A higher proportion of MSc courses (23.2%) than BSc courses (1.7%) were given in English.

The probability that an FAW course was taught as a block was significantly influenced by the REGION ($\chi^2_4 = 10.9$, $P = 0.028$). The highest probability of block teaching was in the North West region and its proportion differed significantly from the East Central region which had the lowest probability of block teaching (29.4 vs 2.9%).

The number of ECTS credits for a course containing FAW was significantly influenced by the REGION ($F_{4,109} = 13.31$, $P < 0.001$) and the OVERALL PROGRAMME ($F_{1,109} = 14.74$, $P < 0.001$). ECTS credits in the North West (6.6 credits) and Balkans (4.6 credits) were significantly higher than in the other three regions (Figure 5). The average number of ECTS credits was higher for animal science courses (4.5 ECTS credits) than for courses in veterinary medicine (2.9 ECTS credits).

Willingness to provide teaching material

The probability of being willing to share teaching material from an FAW course with another lecturer was influenced by the REGION ($\chi^2_4 = 23.3$, $P < 0.001$). A significantly higher proportion of teachers were willing to provide their material in the Mediterranean region (89.1%), Balkans (84%) and East Central Europe (83.9%) than from North West (60.3%) and West Central (35.9%) Europe.

Discussion

There is significantly more teaching related to farm animal welfare in North West Europe than in any other European region. For the purposes of this paper, we based this conclusion on the number of hours within the course actually dealing with farm animal welfare, on the number of ECTS credits as an indication of the length of the course, and on the higher proportion of FAW teaching within each course, so adjusting for the length of the course. This study also found that the courses in North West Europe are more active in their educational style that is to say, with more group discussions and farm visits. This probably reflects a generally more interactive teaching approach in these countries. The reasons for this are largely unclear, but a greater pedagogical

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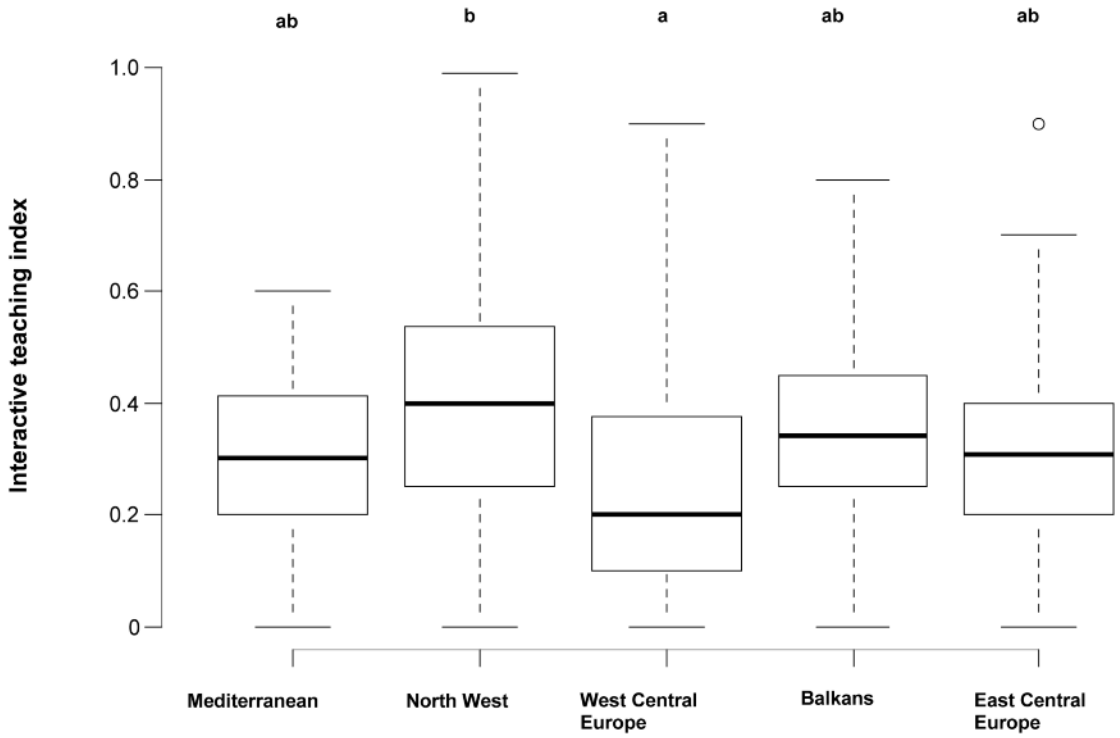
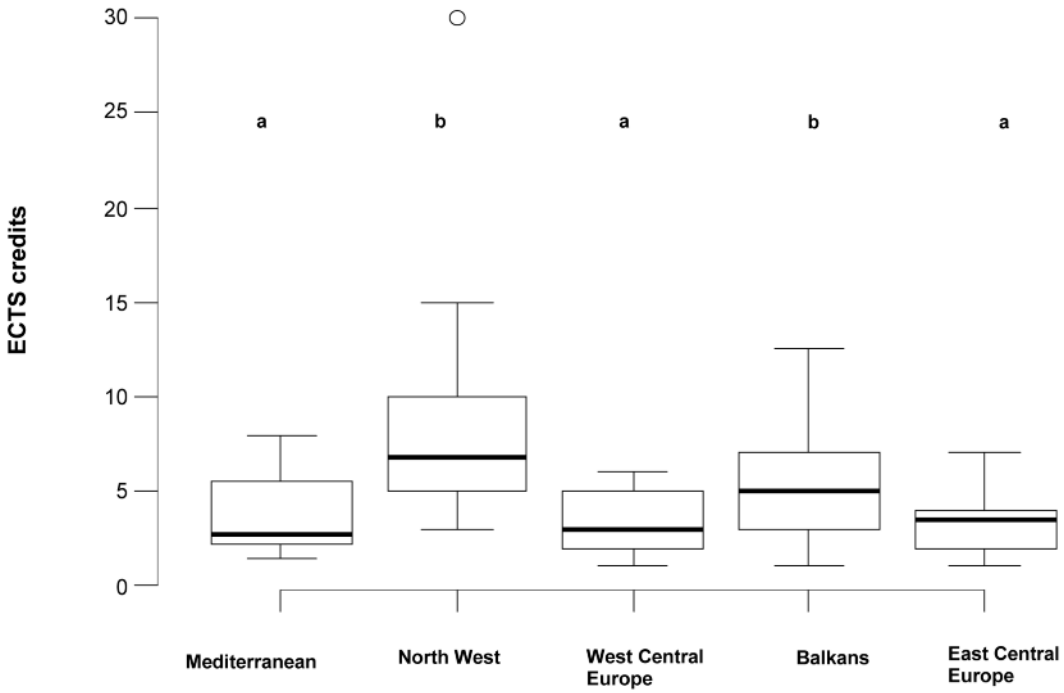
Figure 4



Boxplot showing the interactive teaching index of FAW courses per REGION. The boxplot shows the median, first and third quartile and the minimum and maximum. Different letters indicate significant differences between REGIONS ($P < 0.05$).

Figure 5



Boxplot showing European Credit Transfer Systems (ECTS) per REGION. Different letters indicate significant differences between REGIONS ($P < 0.05$). The boxplot shows the median, first and third quartile and the minimum and maximum.

awareness about the advantages of interactive teaching and better training in these methods may play a role. Our results thus bring multiple evidence that more intensive education on the welfare of farm animals is given in North West Europe than in any other region. This supports the trend seen earlier in veterinary education (Briyne 2011) and shows that it also applies to animal science.

We did not statistically evaluate the number of courses with farm animal welfare per region as the regions vary in size (in terms of population and geographically), plus replies were not received from all universities. Nevertheless, there are indications that the number of courses dealing with farm animal welfare is increasing in the new EU member states and candidate countries. Nineteen new courses were being planned at the time of the questionnaire and 17 of these were located in new and candidate countries. Only one country mapped in this survey admitted to having no education and no plans for education in farm animal welfare. There is an increased awareness of the need for education in this topic in Eastern Europe (eg Gurler 2007). However, the number of courses in the old EU member countries has also increased and several three-year Bachelor programmes dealing with animal welfare have recently been established in North West Europe. This means that the 'gap' in farm animal welfare education is still present, even if there is now much more farm animal welfare education at university level in Europe generally. However, the difference seems to be between the North West Europe and all other regions and not, as predicted, between the old EU and new EU or candidate countries.

The regional and cultural differences underlying the variation in the availability of education about farm animal welfare do not seem to be reflected in the content of the courses that do exist. For example, there was no support for our hypothesis that the focus of the education in Eastern countries would be more towards applied aspects. Also, contrary to our prediction, there was no difference in the proportion of obligatory farm animal welfare courses between regions. This may indicate that farm animal welfare teaching is given the same relative importance in the new and candidate countries as it is in the old EU member states.

A difference in teaching focus was apparent when comparing veterinary and animal science education. There was a greater emphasis towards welfare assessment and legal aspects in the veterinary education, which is perhaps not surprising given the frequent role of (state) veterinarians in the control of EU welfare legislation. There might be a need to include more about the fundamental scientific basis of animal welfare into the veterinary curricula given the fast-increasing attention to animal welfare by the veterinary profession (Fraser *et al* 2013). However, there was no difference in the total number of hours addressing farm animal welfare issues in the two education programmes. Previous surveys have focused, almost exclusively, on veterinary education (Hewson *et al* 2005; Briyne 2011) and although it adds new knowledge to be able to compare this with the animal science education, there were unfortunately too few replies related to animal welfare education in other programmes to be able to compare the animal welfare focus in a wider range of programmes. That the Master level teaching was more interactive than the Bachelor level may reflect both a focus on knowledge transfer and larger class sizes in undergraduate courses and the fact that Masters courses typically promote more self-directed learning (eg Qualifications framework in the UK, http://www.qaa.ac.uk/AssuringStandardsAndQuality/Qualifications/Pages/default.aspx). This rather rough distinction of teaching approaches however does not allow any comparison of the didactic quality of the education. Recent developments, eg in terms of using electronic resources to promote individual student participation in large groups such as audience response systems (Stowell & Nelson 2007), may additionally blur the borders between transmissive and interactive teaching.

Given the above findings, it becomes important to know where students in a region with less opportunity to attend block-taught or interactive farm animal welfare courses can turn to get more farm animal welfare education. When considering this, the course language becomes an important issue. Even excluding the UK and the Republic of Ireland, the number of courses held in English was still high in North West Europe. One reason can be that the Scandinavian languages and Dutch are spoken by fewer people than, for example German, which is the dominant language in West Central Europe. The other might be a specific aim of universities in these countries to attract students from other countries/regions to their courses, which is supported by the tendency to have more courses open to students from other countries/regions compared to other regions and by the fact that the courses are more likely to be taught in a block so that a student can join and complete a course in a short period of time. Perhaps in view of competition to attract students, teachers in these North West European countries are less likely to share their teaching material. This may reflect the more interactive teaching methods (with less written course material), institution policies or copyright concerns. More detailed information regarding the latter aspects were not available. We also cannot exclude that another possible reason for negative responses were concerns that the material provided may not be understood or used appropriately or that lecturers that have abundant material perceive less benefit to themselves in sharing materials with colleagues in other regions.

Higher level courses are also more likely to be open to students from other countries/regions. This is to be expected, as they are usually more specialised, and for this reason are also out of necessity more likely to be held in English. At the same time, mobility of postgraduate students is likely to be higher. Why so many courses in East Central Europe are held in English is unclear. One possibility is that universities in the four East Central European countries are frequent hosts to students on Erasmus or similar exchange programmes and this fact increases the need for English-taught courses. Courses in this region though were least likely to be taught as a block, which may make them less attractive to students from other countries/regions.

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This questionnaire focused on farm animal welfare. We cannot therefore comment on education on the welfare of laboratory, pet or other categories of animals, and how that might vary across Europe. The remainder of courses presented in this survey as dealing only partly with farm animal welfare, may be addressing the welfare of other species for the rest of the time. Or it may address some other aspect of farm animal production, housing or health control for the remainder of the course time. It does mean, however, that this survey probably underestimates the total education in animal welfare across Europe. Based on our survey figures alone, it does seem that education in farm animal welfare is available to some extent in all regions of Europe.

Admittedly, there are limitations to the data collected in this study. First, we were not able to map all farm animal welfare courses using the recruitment method applied. The data may therefore not give the full picture about this field of education. Nevertheless, the high response rate of 60% of identified universities with FAW teaching indicates good coverage and the number of farm animal welfare courses mapped per region was sufficient for capturing between-region differences. Second, between-region differences could have been biased if respondents from different countries perceived or understood the questions in different ways. To reduce this risk, the questions in the questionnaire were formulated as simply as possible and they were cross-checked in a pilot version by hub leaders from all regions. Thirdly, it is possible that despite our efforts to obtain information from the broadest possible group of courses, those course tutors with greater interest or pride in the animal welfare content of their course may have been more likely to respond. This may have biased the results. Finally, quantitative variables such as the length of a course do not allow assumptions about the quality of the education; more hours do not necessarily mean better quality.

The authors are aware that the animal welfare implications of these results must be considered with these limitations in mind. Nevertheless, the data set provide a unique insight into the geographical variation in farm animal welfare education at European universities, thus providing a starting point for closing the revealed gaps and utilising the opportunities exposed by this mapping exercise.

Animal welfare implications

Reliable and comprehensive science-based knowledge about animal welfare issues is essential when dealing with the welfare problems facing the livestock industry. Veterinarians, as well as experts in animal science, play a crucial role in advising animal owners on best practices and on identifying and treating problems in the field. Also, they co-operate with official competent authorities in the respective countries on implementation of European animal welfare policies. The present paper reports on substantial differences regarding the way in which veterinary medicine and animal science students are taught about farm animal welfare in different parts of Europe. These differences in teaching intensity do not seem to match differences in perceptions of animal welfare among the general public. In the Eurobarometer special survey of 29 EU and candidate countries (Eurobarometer 2007), people from the seven countries of the East Central region assigned lower importance to FAW (median 7.34 on a 1–10 scale), but the remaining four regions did not differ (range 7.84 to 8.25) so the North West region did not stand out as it did in our study. Rather, it seems that the differences in teaching go hand-in-hand with the level of more specific factual provisions in FAW, such as the availability of clearly labelled animal-friendly products in the shops (Eurobarometer 2007; p 45), the intensity of FAW information flow between academic institutions (knowledge providers), competent authorities and end users (farmers, abattoirs) (Fraser *et al* 2013) and the existence of governmental animal welfare policy. Although it is likely that societal activities in FAW affect the extent and content of the teaching curriculum, the reverse is also likely: comprehensive knowledge regarding animal welfare among veterinarians and animal scientists will increase stakeholder perception of animal welfare as well as stakeholder understanding of relationships between farm animal welfare and animal health, added value economics and sustainability of animal husbandry in the European ethical and legal context. Ingenbleek *et al* (2012) recommend targeting veterinary education as one of the ways to improve the level of animal welfare in a country. Especially with regard to farm animal welfare, this recommendation similarly applies to animal science education. At the same time, strengthening fundamental teaching might help improve research in this field and therefore also opportunities for research careers. Courses given in English and taught as blocks increase the opportunities for student mobility. Thus, specific recommendations as to how to nurture opportunities for young academics in the field of animal welfare in countries outside the North West region include more hours of FAW teaching, more interactive methods of teaching which are oriented to students and conceptual change thus facilitating deep learning, expansion of courses taught in English as well as utilisation of the mobility opportunities.

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