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# The use of nutritional supplements in dressage and eventing horses

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## ABSTRACT

The aim of the study was to determine which types of nutritional supplements were used in dressage and eventing horses, and the reasons that owners used supplements. An online questionnaire was distributed through British Eventing and Dressage websites, to collect data on demographics of owners and their horses, supplements used and their opinion on health and performance problems. Data were evaluated using descriptive analysis, Sign and Fisher's exact tests for quantitative data, and categorisation of qualitative data. In total, 599 responses met the inclusion criteria (441 dressage and 158 eventing horse owners). Participants had 26.4 (3–60) (mean (range)) years of riding experience, owned 1.2 (0–10) horses and used 2 (0–12) supplements in their highest performing horse. The main health and performance issues identified for dressage were 'energy/behaviour', 'lameness' and 'back and muscle problems'. The main issues for eventing were 'stamina and fitness levels', 'lameness' and 'energy/behaviour'. The main reasons for using supplements in their highest performing horse were 'joints and mobility', and 'behaviour' for dressage, and 'electrolytes', and 'joints and mobility' for eventing. Lameness and behavioural problems were significant concerns within both disciplines. There was incongruence between owners' opinions of problems within their discipline and their reasons for using supplements.

## INTRODUCTION

There are a large range of equine nutritional supplements currently available in the UK, with 171,400 purchases annually. In 2011, the market was worth £34 million, and the mean annual supplement spend/person was £198 (BETA 2011). There are a number of factors that may determine a horse owner's choice of nutritional supplement for their horse, including discipline-specific health and performance problems, and any pre-existing problems or injuries in an individual animal (Williams and Burk 2010). There is a lack of published studies on why horse owners use different supplements, and currently, the scientific evidence on the efficacy of supplements in the prevention and management of health and performance problems is limited

(Noble and others 2008, Vandeweerd and others 2012, Talbot and others 2013). The majority of research relates to osteoarthritis; however, a systematic review of the effect of nutraceuticals on clinical signs of pain or lameness in 2012 concluded that there was a low strength of evidence for efficacy in the horse (Vandeweerd and others 2012). Research into the use of nutritional supplements in people has shown that demographics, lifestyle characteristics and any concurrent medical conditions affect individuals' decisions to use nutritional supplements (Gunther and others 2004, Jasti and others 2003). There is currently no data on how horse owners choose nutritional supplements for their horse, nor is there any information on their opinions of health and performance issues within different equine competitive disciplines.

The aims of this study were to determine which types of nutritional supplements horse owners/riders use in their horses, and how their choice of supplements is related to their opinion of health and performance problems in different disciplines. The two study populations chosen were dressage horses and eventing horses as there are differences in the athletic demands and veterinary problems associated with these two disciplines (Murray and others 2010b).

The study objectives were to:

- describe the demographics and experience of owners/riders of dressage and eventing horses who participated in the survey;
- evaluate owners'/riders' opinions on the most important health and performance issues within the disciplines of dressage and eventing;
- determine which types of supplements horse owners/riders were using and their reasons for doing this.

## MATERIALS AND METHODS

An online questionnaire was developed to gather information from owners and riders



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competing in dressage and eventing. Nutritional supplements were described as 'nutritional supplements commonly used to improve performance or prevent or treat health problems'.

The questionnaire was divided into four sections. Section 1 was general information about the participant (including age, sex, years of riding experience, discipline and level at which they were competing). Section 2 was the participant's opinion on the health and performance problems within their discipline, and information on the horses that they own/ride, and the nutritional supplements they feed. Section 3 was specifically about any health and performance problems in their highest performing competition horse, any supplements used in this horse, the reasons for using this and their opinion of the supplements used. Section 4 asked about the sources of information used for choosing nutritional supplements and the participant's opinion on these different sources (see online supplementary item 1). This section relating to the sources of information is described in a separate report (Gemmill and others 2016).

The questionnaire included closed multiple-choice questions, single-answer and multiple-answer options, and open free-text questions (www.surveymonkey.com). Categories of nutritional supplements were developed based on the different supplements that were currently commercially available. Links to the questionnaire were distributed primarily via British Eventing, British Dressage, Dodson and Horrell Ltd, and University of Nottingham websites, and there were secondary distribution through press releases and social media to other websites.

Inclusion criteria for analysis were horse owners and/or riders who were competing in dressage or eventing. Responses from people competing in other disciplines or in both of these disciplines were excluded from analysis. Data that met the inclusion criteria were downloaded into Microsoft Excel (Microsoft Office Suite 2007, Microsoft). Data analysis included descriptive analysis for quantitative data (mean, mode, range and percentages). For categorical data, graphs were used to analyse responses and assess normality of data. Mean or mode values and ranges, and percentages of distributions across each discipline were recorded in tables for analysis of numerical responses. Fisher's exact test (Minitab 16.1.0, Minitab) was used to compare the health and performance problems between the two disciplines of dressage and eventing. The Sign test (Minitab 16.1.0, Minitab) was used to compare dressage and event riders' views on nutritional supplements, and to compare differences in the perceived importance of supplements. Results were considered statistically significant at  $P < 0.05$ . Qualitative data were analysed by categorising responses and ranking frequency of occurrence.

## RESULTS

The questionnaire was originally distributed via the British Eventing, British Dressage and Dodson and

Horrell Ltd websites. However, it was also hosted on other websites after the press release, which included:

www.horsetalk.co.nz/news/2011/10/055.shtml  
 www.mrcvs.co.uk/en/news-story.php?id=6302  
 www.brooksbymelton.ac.uk/aggregator/sources/4  
 www.keur.ca/News/Equestrian/British-Dressage.htm  
 www.equitogs.co.uk/pages/Dressage-Feed.html  
 http://berrifielddressage.co.uk/aggregator/sources/1

British Eventing and British Dressage also highlighted the survey on Facebook and Twitter.

In total, 820 horse owners/riders participated in the questionnaire, and the completion rate for the survey was 80 per cent (656/820). Also, 599 participants met the inclusion criteria, competing in either dressage (441 respondents) or eventing (158 respondents). The number of responses for each category (x) compared with the total number of responses for that question (y) were given for each section (x/y).

For both dressage and eventing categories, the majority of participants were female and were in the 22–34-year-old-age category (Table 1). Participants had a wide range of riding experience, with the number of years that participants had been riding for ranging from 5 to 60 years for dressage and 3 to 50 years for eventing (Table 1). The majority of riders competed at novice affiliated level in both disciplines (36.8 per cent of participants for dressage and 49.7 per cent for eventing), and the competition category that had the fewest participants was advanced affiliated for both disciplines (16.5

**TABLE 1:** Owner demographics of 599 horse owners and riders\* that completed an online questionnaire on the use of supplements in horses competing in dressage or eventing

Owner demographics	Dressage owners/riders	Eventing owners/riders
Mode (percentage of respondents) age range of owner/rider (years)	22–34 (31.3%)	22–34 (43.3%)
Mode (percentage of respondents) gender of owner/rider	Female (97.4%)	Female (91.3%)
Mean (range) number of years owner/rider had been riding	28 (–60)	22 (3–50)
Mean (range) number of years respondent had been competing in the discipline	6 (0.2–40)	9 (7–35)
Level of competition (n=566)		
Unaffiliated	100 (23.9%)	24 (16.3%)
Novice affiliated	154 (36.8%)	73 (49.7%)
Intermediate affiliated	96 (22.9%)	37 (25.2%)
Advanced affiliated	69 (16.5%)	13 (8.8%)

\*If smaller numbers of respondents completed a section, the number of respondents is given as (n=)

per cent of participants for dressage and 8.8 per cent for eventing) (Table 1). The mean number of horses that each participant competed was one horse for dressage owners and two horses for eventing (Table 2). When asked about their highest performing or 'top' competition horse, the mean age of this horse was 11 years and the most common breed was thoroughbred or thoroughbred cross for both dressage and eventing (Table 2). The highest performing competition horse was competing in a mean of 12 events per year for dressage and 17 events per year for eventing, and was fed a mean of two supplements for both groups (range 0–6 supplements for dressage and 0–12 supplements for eventing) (Table 2). The main reasons participants identified for giving supplements to dressage and eventing horses were to treat a specific problem (Table 2). Also, 29 out of 542 respondents to this question stated that they did

not use supplements (20 dressage owners and 9 eventing horse owners) (Table 2).

Free-text responses by participants describing what they considered to be the most important health and performance problems within their discipline were reviewed and categorised. The most frequently identified categories of problems within the discipline of dressage were (1) energy levels and behavioural issues (42.2 per cent), (2) lameness (37.1 per cent, including joint problems, arthritis, tendon, ligament and soft tissue injuries) and (3) back and muscle problems (15.4 per cent). Other problems identified less frequently included gastrointestinal problems (including colic, digestive problems and gastric ulcers), hoof condition and hoof balance, respiratory problems, dehydration and electrolyte balance, and stamina. Participants were then asked for the reasons that they fed nutritional supplements, choosing three ranked reasons from multiple predefined categories. The most frequently identified reasons for feeding supplements to dressage horses were (1) joints and mobility (78.4 per cent), (2) vitamins and minerals (46.1 per cent) and (3) behaviour (45.9 per cent) (n=388) (Fig 1).

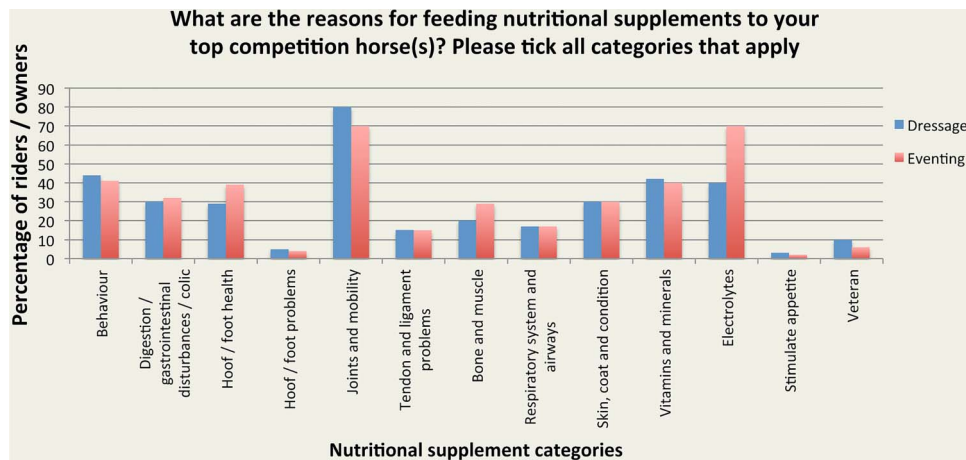
The most frequently identified health or performance problems within the discipline of eventing (using the categories described above) were (1) stamina and fitness levels (43.9 per cent), (2) lameness (41.9 per cent) and (3) energy levels and behavioural issues (37.1 per cent). Other problems identified less commonly included respiratory problems, back and muscle problems, hoof condition and balance, gastrointestinal problems, and dehydration and electrolyte balances. The most frequently identified reasons that eventers (n=132) gave for using supplements (choosing from multiple predefined categories) were (1) electrolytes (70.5 per cent), (2) joint and mobility (68.9 per cent) and (3) behaviour (43.9 per cent) (Fig 2).

Categorisation of free-text responses to the question, 'Out of all the supplements that you feed, what is the name of the supplement you consider to be the most important?' produced a wide range of responses. However, for both dressage and eventing owners/riders, joint supplements were named most frequently (57 per cent, n=492). This was followed by behavioural supplements for dressage horses (9 per cent, n=376) and electrolytes for eventing horses (8.6 per cent, n=116). The majority of respondents listed the products they used, but some also gave reasons of why they used them, and these reasons were categorised. All of the behavioural supplements that were listed by participants were used for a calming effect on the horse. Behavioural supplements were mentioned by a few eventing horse owners and riders, but at a much lower level compared with the dressage horse owners/riders. The reason that the majority of eventing horse owners/riders gave for the importance of electrolytes was related to the intensity of the cross-country phase. The frequency with which electrolytes were identified was significantly

**TABLE 2:** Demographics of competition horses and reasons for feeding nutritional supplements from an online questionnaire of 599 owners and riders of dressage and eventing competition horses\*

	Dressage owners/riders	Eventing owners/riders
Mean (range) number of horses that the respondents were competing	1 (0–7)	2 (0–10)
Mean (range) age of top competition horse (n=537)	11 (4–21) years	11 (4–29) years
Most common breed of top competition horse (n=537)	Thoroughbred Thoroughbred cross Irish sports horse	Thoroughbred cross Warmblood
Mean (range) number of events in which top horse competed per year (n=537)	12 (3–50)	17 (0–104)
Main reason identified by participant for feeding nutritional supplements to their horse (n=542)		
Treatment of a specific problem	143 (35.3%)	45 (32.8%)
Prevention of a high-risk problem	137 (33.8%)	39 (28.5%)
Enhancement of performance	105 (25.9%)	44 (32.1%)
Supplements not used	20 (4.9%)	9 (6.6%)
Mean (range) number of supplements fed to top horse (n=537)	2 (0–6)	2 (0–12)

\*If smaller numbers of respondents completed a section, the number of respondents is given as (n=)



**FIG 1:** Reasons identified by dressage (n=388) and eventing (n=132) horse owners/riders for using nutritional supplements to all their horses (choosing from multiple predefined categories) from an online questionnaire on the use of nutritional supplements

greater for eventing owners/riders compared with dressage owners/riders ( $P < 0.05$ ).

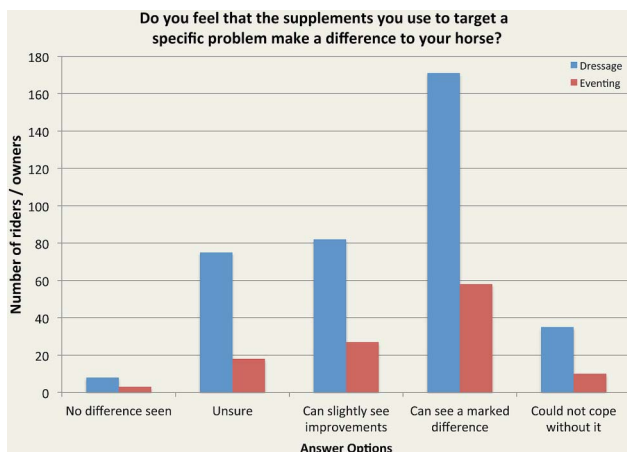
The last section of the questionnaire related specifically to the owner's/rider's decisions and approaches to use of supplements in their highest performing competition horse. This included the main reasons for using nutritional supplements in their highest performing horse (with multiple-option responses), the single most important reason for using supplements (single response), and any health and performance problems that affected this horse (multiple-option responses).

The main reason (multiple responses) and most important reason (single-set answer option) for using nutritional supplements in their highest performing horse for both dressage (41.8 per cent) and eventing owners/riders (35.6 per cent) (n=496) was joints and mobility. Behaviour was ranked as the second reason for using supplements for dressage owner/riders (15.1 per cent) and electrolytes for eventing owners/riders (10.2 per cent), and vitamins and minerals were ranked as the

third reason for feeding supplements for both disciplines (dressage 12.9 per cent, eventing 10.2 per cent). Behavioural issues were considered by owners to be the most important health and performance problem in their highest performing horse for both dressage and eventing, followed by joints and mobility (n=374). The number of owners/riders identifying electrolytes as a problem in their horse was significantly higher for eventing compared with dressage ( $P < 0.05$  Fisher's exact test).

The majority of dressage and eventing horse owners and riders (n=509 total respondents, dressage n=371, eventing n=122) felt that they could see a marked difference in their horse when they have fed a specific supplement to target a problem. Opinions varied between the five answer options from: 'no difference seen' to 'could not cope without it' (Fig 1).

The majority of dressage and eventing horse owners/riders (n=426 respondents, dressage=324, eventers=102) felt there were appropriate supplements to treat problems in their disciplines (set answer options of 'yes', (dressage 75 per cent, eventers 92 per cent), 'no' (dressage 25 per cent, eventers 8 per cent) and 'not sure' (0 per cent)).



**FIG 2:** Opinions of 371 dressage and 122 eventing horse owners and riders on whether the specific nutritional supplements they use make a difference to their horse(s)

## DISCUSSION

The aim of this study was to investigate some of the reasons why horse owners and riders chose nutritional supplements and how this varies between competitive disciplines. The findings illustrated that a wide range of different supplements were used, and most owners and riders perceived that they were important to their horse's health and performance. Lameness and/or joint problems were identified as important issues in both disciplines, which is consistent with previous literature (Pearson 2009, McIlwraith 2010b, Murray and others 2010a, Murray and others 2010b). This study also highlighted the perceived importance of behavioural problems within both disciplines. There were incongruencies in owners'/riders' opinions of health

and performance issues within their competitive disciplines and their horses, and the supplements that they were using, which warrant further investigation.

Owners/riders of dressage horses identified behavioural issues and energy levels as the most important issue within their discipline, followed by lameness, then back and muscle problems. They also identified behavioural issues as the main problem in their highest performing horse, followed by 'joints and mobility'. However, their main reason for feeding supplements was for 'joints and mobility' problems.

There were different trends for responses from owners/riders of eventing horses. They identified stamina and fitness as the main issue in their discipline, followed by lameness, and behaviour issues and energy levels were the third most commonly identified health and performance issue for eventing. However, the main problem in their highest performing horse was identified as behavioural issues, followed by joints and mobility, which mirrors the response from dressage owners and riders to this question. Once again, their opinion of health and performance problems was not mirrored in the use of supplements, and the main reasons for giving supplements were for electrolytes, and 'joints and mobility'. There are a number of possible reasons for the incongruency between owners' opinions of main problems and their reasons for using supplements. Further study is needed to investigate this, but possible factors may include the limited number of scientific studies on behavioural issues in horses. There is also limited evidence on the efficacy of behavioural supplements (Freire and others 2008, McCall 2009, Noble and others 2008, Talbot and others 2013) or how owners obtain and assess the different source of information on supplements. In contrast, there are considerably more studies on the use of supplements to enhance joint function and mobility (Hanson and others 1997, Clayton and others 2002, Forsyth and others 2006, Gupta and others 2009, Pearson and Lindinger 2009, McIlwraith 2010). This may explain why owners and riders consider these supplements to be important to use in their horse, although the evidence of efficacy is still low (Vandeweerd and others 2012). Another reason for the perceived importance of using nutritional supplements for 'joints and mobility' may be because owners are using supplements as a preventative measure (to try and reduce the risk of developing joint and mobility problems) rather than using them as a solution to a current health or performance problem. Further research, for example, using focus groups or interviews, would help to explore owners'/riders' perceptions and the factors that may affect their decision-making.

This study had a number of limitations; the use of an online survey may have introduced some bias as the websites may not be accessed by all of the potential participants. Secondary distribution through a range of media, including equine magazines, Facebook and Twitter sites, increased exposure to a wider population. Use of online

surveys is becoming increasingly common, but direct mailings of target populations may be more effective in some cases. The study by Murray and others (2010a) investigated risk factors for lameness in dressage horses, using a questionnaire sent to all members registered with British Dressage in 2005 (totalling 11,363), with a response rate of 22.5 per cent. The present study had a lower number of respondents, and response rates could have been improved by directly mailing all members of the disciplines. The study gave a description of nutritional supplements, and had predefined categories of types of supplements for a number of questions. 'Balancers' were not included as a separate category, and the study did not specify whether they should be included as 'supplements'.

Previous published studies on nutritional supplements have focused on small numbers of horses in specific populations (Hoffman and others 2009) or those competing at the top of their discipline (Burk and Williams 2008, Leahy and others 2010). This study had a larger population of participants, and the population demographics showed a wide distribution of age and experience of both participants and horses. Previous studies have investigated the incidence of different health problems in performance horses (Kaye 2006, Murray and others 2010a, Singer and others 2008), but this is the first study to report owners'/riders' perceptions of health and performance problems in their discipline. The mixed methodology produced some aspects of the data that were captured with predefined categories, but also used free text for key questions to enable participants to express their opinions. The open free-text questions in this study produced a wide range of responses, which differed from existing literature, and highlighted the value of qualitative data collection. There is potential for bias within the study, based on participants' opinion of the focus of the questionnaire, for example, asking participants to select a supplement from a predetermined list may limit their choices or participants may give the answers that they think the researcher is looking for. An alternative methodology is the use of interviews and/or observations and visits to determine what supplements participants are using and why; however, this usually limits studies to a smaller number of participants. Questionnaires can be useful to collect data from a wider population, to identify key themes and areas that can be investigated in more detail using interviews or focus groups.

This study highlighted differences between the disciplines of dressage and eventing. It identified the perceived importance of electrolyte supplements in eventing horses and behavioural supplements in dressage horses, which reflects some of the current literature and differences between the two disciplines (Meyer 1986, Schott 2010, Ecker and Lindinger 1995, Pagan 2010, McCutcheon and others 1995; Grimmitt and Sillence 2005; Friere and other 2008; Talbot and others 2013). This is consistent with owners and riders having

an understanding of the issues within their discipline and choosing supplements based on this.

Electrolyte balance problems have previously been identified as a problem in eventers (McCutcheon and others 1995, Ecker and Lindinger 1995). In this study, dressage riders identified energy and behaviour as the main problem within their discipline, but their main reason for feeding supplements was stated as joints and mobility issues. As discussed earlier, this may reflect the lack of evidence on nutritional supplements for behaviour, but in addition to this, many musculoskeletal issues may cause changes in behaviour and performance. Previous literature has identified that lameness and back problems are key issues in dressage horses (Wennerstrand and others 2004, Murray and others 2010a), and these may affect the horse's ability or willingness to work. Once again, further research using interviews or focus groups would be beneficial to explore people's reasoning and rationales for their decisions.

Despite the low levels of evidence for most supplements, this study showed that they were widely used across both disciplines (with only 29 of 542 participants not using supplements), with most owners stating that they felt that the supplements made a marked difference to their horse. Given the widespread use of supplements and perceived value towards the horse's health and performance, it can be argued that the veterinary profession should have an understanding of owners'/riders' opinions and concerns.

## CONCLUSIONS

This study identified differences in horse owners'/riders' choice of nutritional supplements compared with their opinions of health and performance problems in their competitive discipline. This incongruity may reflect the current levels of evidence for different types of supplements. Future studies using interviews or focus groups would be beneficial to explore some of the factors that influence horse owners'/riders' decision-making. The study also identified both the perceived importance of behavioural issues in dressage and eventing, and the frequent use of behavioural supplements in individual horses. This highlights the need for research into the incidence, frequency and causes of behavioural problems in performance horses, and further research into the efficacy of nutritional supplements in the horse.

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**Ethics approval** The study was reviewed and approved by the Ethics Committee, School of Veterinary Medicine and Science, University of Nottingham.

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**Data sharing statement** The raw data from this study are available from the corresponding author upon request.

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