Journal of Equine Veterinary Science 34 (2014) 1257–1262

Contents lists available at ScienceDirect

Journal of Equine Veterinary Science

journal homepage: www.j-evs.com

Original Research

# The Feeding Practices and Estimated Workload in a Cohort of New Zealand Competition Horses

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ARTICLE INFO

*Article history:*
Received 7 April 2014
Received in revised form 28 July 2014
Accepted 21 August 2014
Available online 27 August 2014

*Keywords:*
Horse
Training
Feeding
Show jumping
Dressage
Eventing

ABSTRACT

Data on the feeding, management, and training schedules during the week before the competition were collected via a face-to-face survey of riders competing in dressage, show jumping, or eventing at 1* and 3* level competitions. Data were collected using a pro forma recording sheet, and measurements of horse height, weight, and body condition score (BCS) were also obtained. A total of 158 of 582 riders (and horses) were surveyed, providing a response rate of 27%. The mean height, weight, and median BCS of the horses were 162 ± 1 cm, 533 ± 5 kg, and 6 (interquartile range [IQR], 5–7), respectively. The majority of horses were at pasture, most (68%, 107 of 158) 24 hr/d and fed supplementary feed either once (42%, 67 of 158) or twice daily (54%, 86 of 158). The supplementary feed was predominately a commercial premix feed (90%, 142 of 157) with additional alfalfa chaff or ensiled chopped alfalfa. The horses were offered approximately 60 MJ digestible energy (DE)/d (33–86 MJ DE/d) from supplementary feed. The horses worked for a median of 6 d/wk (IQR, 5–6 d/wk) with one rest day. The median total time trained during the week was 200 minutes (135–265 minutes), which consisted of eight separate training activities. There was no difference in time spent on different activities between the disciplines. Individual training activities were 30–40 minutes, and the median number of competitions per month was 2 (IQR, 2–3). Training workload and pattern of work were similar to reports from other countries, with the exception that many riders regularly added a "hack out" after training.



## 1. Introduction

Within Australasia, there has been limited literature published on equine feeding practices, with most surveys focused on racehorses [1,2] or commercial Thoroughbred young stock [3,4]. In contrast to the relatively homogeneous industry structure and production goals associated with the racing industry [4], the competition horse and recreation sectors are a relatively heterogeneous group [5–7]. Because of the temperate climate in New Zealand, in contrast to many Northern Hemisphere countries, horses can be kept at pasture year round [8] and the use of livery is relatively uncommon with most of the horses managed by their owners at their own property [9]. Perennial ryegrass is the most common pasture species in New Zealand, which has a high nutritive value, highly persistent, and grows year round. Consequently, this can provide some management issues for the horse owner, particularly horses with equine metabolic syndrome, insulin sensitivity, and those susceptible to perennial ryegrass staggers [8]. It is also difficult for most horse owners to accurately estimate pasture intake and the nutritional value of their pastures when attempting to balance or optimize rations. There is limited

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http://dx.doi.org/10.1016/j.jevs.2014.08.008

literature documenting the management practices in place to address these issues or the broad management of competition horses within New Zealand.

A cross-sectional survey identified that dressage horses in New Zealand had training times and weekly structure of training similar to that reported for dressage horses in the UK [10,11]. These data indicate that the international consistency in the format of dressage competitions may dictate consistent training programs, irrespective of country. However, for elite show jumping horses within Europe, there were highly variable patterns of training and exercise between yards and countries [12]. This variation in training and management may have been influenced by climatic conditions and cultural norms.

It remains unknown if pasture-based management, which is in contrast to the typical European model for horse management, would alter training and management practices of competition horses in New Zealand. Therefore, the aim of this article was to describe the feeding and training practices of horses used for the equestrian sports of dressage, show jumping, and eventing in New Zealand.

## 2. Materials and Methods

### 2.1. Sample Selection

Data were collected from a convenience sample of riders at four equestrian shows affiliated with the governing body for equestrian sport in New Zealand (Equestrian Sports New Zealand) in the lower North Island of New Zealand. These shows were believed to be representative of the competitive sport horse industry and consisted of three 1* shows and one 3* show jumping show during the spring of 2010.

Data were collected as a face-to-face survey on pro forma sheets by four interviewers experienced with the sport horse industry. Riders were approached by the interviewers at either their trucks or within the stabling and/or yard area, provided an overview of the project and a suitable time organized for the interview and measurement of the horse. To avoid repeat sampling across shows, riders were excluded from the survey if data had previously been collected from them.

The survey consisted of 23 questions in four categories covering horse identification and competition experience (graded as advanced, medium, and low; Table 1), current feeding practices, management of the horse at home, and a brief workload diary for the 7 days preceding the show. The survey was pilot tested with four iterations on six riders not familiar with the survey, none of which were included in the final survey.

**Table 1**
Definition of competition categories used to identify workload and competition difficulty/complexity.

| Level Category | Show Jumping (m) | Dressage (Level) | Eventing |
|---|---|---|---|
| Advanced | >1.30 | 5–6 | CCI 3* |
| Medium | 1.20–1.30 | 3–4 | CCI 2* |
| Low | <1.20 | <2 | CCI* and below |

Abbreviation: CCI, Concours Complet International.

At the completion of the survey, the horses were weighed using a customized weight platform (Eziweigh2; Tru-Test, Auckland, New Zealand). The body condition score (BCS) of the horses was recorded separately by the interviewer and the rider using a reference sheet with examples of the Henneke nine-point BCS system [13]. Riders were also asked to report their desired BCS for their horses.

### 2.2. Estimation of Feed Composition and Nutrient Intake

Riders provided a description of the supplementary feed offered to the horse, including brand and/or type of feed offered, volume or weight fed, and the frequency of feeding. The weight of the different feeds offered to the competition horses were subsequently estimated by converting known volumes to weight (in kg of feed offered) for each product identified in the survey. Nutritional composition of the feeds was obtained from literature provided by the feed manufacturer (either from the published feed label details or official company Web page), or for basic feeds (oats, barley, and so forth) the National Research Council (NRC) published values were used [14]. Concentrate feeds were defined as any grains, premixes, muesli, or pelleted ration. Composition data for conserved forages were estimated from published data for New Zealand forages [8,15]. Riders also answered a series of questions describing the management of the horse, including access to pasture, size and type of pasture, and number of conspecifics within the paddock. Estimated digestible energy requirements (MJ/d) for each horse were calculated from the horses body weight using the following equation: DE (MJ) = [(0.0333 × body weight) × 1.60] × 4.184 [16].

### 2.3. Statistical Analysis

Data were manually transcribed from the pro forma recording sheets into a customized MS Access database (Microsoft Corporation, Redmond, Washington). Data were exported and initially screened for coding errors and outliers using simple descriptive statistics and plots. After testing for normality, differences between discipline for height and weight were examined using a simple general linear model. Between discipline differences in BCS, age, nutrient composition of feeds, and workload data were examined using a Kruskal–Wallis test. The distributions of categorical data were examined using chi-square test. Agreement between interviewer and owner for BCS was measured using the Kappa inter-rater agreement test, and the trend in scoring was tested with the Spearman rank correlation. All statistical analyses were performed using STATA 12 (StataCorp LP, College Station, TX) with a significance level set at $P < .05$.

## 3. Results

Data were collected from 192 rider and horse combinations across the four shows, of which 158 had complete data for all sections (demographics and feeding, workload and BCS, and weight). The estimated response rate at the shows ranged from 14% (29 of 170) at a 1* show jumping show to 39% (45 of 95) for the dressage show. The