Journal of Equine Veterinary Science 156 (2026) 105736

Contents lists available at ScienceDirect

Journal of Equine Veterinary Science

journal homepage: www.elsevier.com/locate/jevs

# Opinions of trainers of Warmblood, Thoroughbred and Trotter horses in Germany on the pretraining management of yearlings and two-year-old horses – a qualitative analysis

F. Pilger [a], C. Aurich [a,b], J.E. Aurich [b,*]

[a] Graf Lehndorff Institute, Vetmeduni Vienna, 16845 Neustadt (Dosse), Germany
[b] Center for Animal Reproduction, Department for Small Animals and Horses, Vetmeduni Vienna, 1210 Vienna, Austria

ARTICLE INFO

*Keywords:*
Age
Horse
Housing
Trainer
Welfare

ABSTRACT

*Background:* The early career start of racehorses, the pretraining of two-year-old Warmblood stallions for licensing, and individual housing of young horses increasingly raise animal welfare concerns.
*Aims/objectives:* Assess pretraining practices and the opinion of trainers on housing of young horses, minimum age to commence training and pretraining injuries.
*Methods:* Qualitative interviews with trainers of Warmblood stallions and Thoroughbred and Trotter racehorses (n = 10 each).
*Results:* Pretraining of Thoroughbreds and Trotters began at 18 months, whereas licensing preparation of Warmblood stallions began at 29-30 months. For horses not achieving the expected results, procedures for Warmblood stallions differed from racehorses. Warmblood stallions not meeting expectations were often castrated and trained as riding horses, whereas Thoroughbreds and Trotters remained in training, but intensity was reduced. Warmblood trainers did not report injuries requiring pretraining interruption. Thoroughbred and Trotter trainers suggested tendon damage as an occasional problem. Group housing was not utilized because of the risk of injury due to agonistic behavior, especially among stallions, the difficulty of individual feeding and disruption in a group whenever horses were removed and returned. Straw bedding was used in 28 out of 30 yards and horses were fed 8-10 kg of hay/day. Except for three yards, horses were provided contact with neighbors through bars in the side walls of the stalls.
*Conclusions:* Trainers largely fulfilled legal horse welfare requirements but horses had limited free movement and social interaction. None of the trainers agreed with the suggestion of a minimum age of 30 months for training.

## 1. Introduction

Horse racing and equestrian sports are important to society in terms of participant and spectator enjoyment, benefits to human health, and economic impact, but inevitably expose horses to potential physical and psychological challenges. The use of horses in sport continues to be accepted by most of the public, but that social license is increasingly tenuous [1]. A survey of the International Equestrian Federation (FEI) indicates that two-thirds of the public do not believe horses enjoy being used in sport and have concerns about their welfare [2].

In public consciousness, racing fatalities, the fate of retired racehorses and the use of the whip are among the pertinent issues with regard to racehorses, whereas in equestrian sports, riding techniques such as forced hyperflexion of the neck in dressage, "poling", i.e., targeted touching of the horse's legs during jumping of obstacles to increase its attention and whipping of horses in training and competitions are perceived as unfair to the horse and non-acceptable [3–5]. Further issues raised are the early career start of racehorses with training of yearlings and racing of two-year-olds, and the pretraining of two-year-old Warmblood sport horse stallions for breed registry licensing before their first breeding season as three-year-olds [3,6–8]. In contrast to public opinion, physiological, clinical, and epidemiological data indicate that stimulation of the equine musculoskeletal systems at a young age supports physical health and longevity, particularly by enhancing bone strength and articular cartilage development. Racehorses that enter training as two-year-olds therefore have a reduced overall risk of

* Corresponding author.
*E-mail address:* joerg.aurich@vetmeduni.ac.at (J.E. Aurich).

https://doi.org/10.1016/j.jevs.2025.105736
Received 19 May 2025; Received in revised form 19 November 2025; Accepted 19 November 2025
Available online 20 November 2025

musculoskeletal injuries [9–13].

In training stables, horses are usually housed in individual boxes with limited contact to conspecifics. This is increasingly questioned and group housing advocated as the best way to keep domestic horses [14–18]. In case horses are housed individually, they should not be isolated and have contact to horses in neighboring boxes through grids or openings in the partition between boxes [19,20]. Contact among horses, however, also allows for a direct transfer of pathogens and therefore hinders the implementation of biosecurity measures in training stables and racetracks [21].

Public, media and governmental unease about health and welfare issues in sporting equines across disciplines, including training and housing increasingly have to be addressed by the regulatory organizations that govern horse racing and equestrian sports. In Germany, it has become illegal to train or compete horses younger than 30 months of age, but racing is currently exempt from this regulation [22]. If the exemption is not extended, there is concern in the horseracing sector that Germany could seek to have its 30-month rule adopted by all European Union member states [7,8]. Furthermore, according to German Government guidelines, young horses must be kept in groups until the age of 30 months, and only in cases of aggressive behavior can be stabled individually [22].

Most scientific studies on Thoroughbred racehorse training have been published by researchers based in the UK, whereas the trainers interviewed for our study are from Germany. Although horse racing follows similar rules worldwide, some differences among countries exist and training and racing in Germany on average may put less strain on the horses than in Anglo-American countries. The rules of the governing bodies for horseracing in Germany in part go beyond the international regulations. The first race for two-year-old Thoroughbreds is not scheduled before 15 May of the year and the German trotting Derby is only open to four-year-old horses. As a result, two-year-old Thoroughbreds in Germany run on average 2.5 races per year, while Thoroughbreds of the same age in the UK and Ireland consistently run one more race, averaging 3.5 races [23]. It has also been suggested that UK racehorses may be trained more intensively compared to 30 years ago because of access to modern all-weather surface tracks in the UK. This allows training and racing throughout the year but does also result in greater exposure of horses to potentially detrimental effects of exercise [24]. Comparable changes in the training infrastructure are less evident on many German racetracks and training is scaled down during winter on smaller tracks.

This study aimed at analysing pretraining practices and the personal opinion of trainers in Germany on housing of young horses, minimum age for training and on signs indicating that horses might drop out of pretraining transiently or permanently. This was achieved using qualitative interviews. We hypothesized that trainers have a positive view of horse welfare but trainer perception and training yard practice do not always correspond with scientific evidence.

## 2. Materials and methods

### 2.1. Ethical approval

In the country where the study was performed (Germany), there is no legal requirement to obtain ethical approval by a competent authority for interviews in social science projects, unless the interviews address medical or patient-related issues, include minors or if there is a potential for significant risk to participants. None of these was the case in the present study.

### 2.2. Selection of interview participants

Interviews were conducted by the first author (FP) throughout 2023 and 2024 with trainers involved in the preparation of young Warmblood sport horse stallions for stallion licensing (Warmblood trainers, n = 10), Thoroughbred racehorse trainers (n = 10) and Trotter trainers (n = 10). Inclusion criteria for the interviewees were a German trainer license for Thoroughbred or Trotter racehorses or membership of a German Warmblood breed registry. Breed registries do not require or issue a formal license for Warmblood stallion pretraining. All participants were based in Germany. Interviewees were recruited by purposeful sampling. Warmblood trainers were selected at random from stallion lists of breed registry licensing events. Thoroughbred and Trotter trainers were selected at random from current lists of trainers available via the homepages of the German Thoroughbred and Trotter racing associations. In Germany, only 40 to 50 two-year-old Trotters are entered into racing annually (German Trotter Breeders´ Association, personal communication, 18 February 2025) and individuals training young Trotters are thus an extremely small group. For this group only, additional snowball sampling had to be used to recruit 10 interviewees, i.e., interview participants were asked to suggest other persons that would qualify for inclusion into the study. Following these suggestions three Trotter trainers were contacted all of which participated in the interviews. Out of the 30 interview participants six were female and 24 male, with two female trainers for Warmbloods, Thoroughbreds and Trotters each.

### 2.3. Interviews

The selected interview participants were initially contacted by e-mail and received a leaflet to provide an overview of the aims and the design of the project. The leaflet made interviewees aware of the broader topics to be discussed and provided information about the funding of the research and contact details for the interviewer (FP) and the project principal investigator (CA). Participants were then contacted by telephone to arrange the interviews. The interviewees were assured that their responses would be evaluated strictly anonymous. In total, 65 trainer were contacted by e-mail. Out of these, 16 were Warmblood trainers, 21 Thoroughbred trainers and 28 Trotter trainers. A total of 31 trainers agreed to participate in the study but one Warmblood trainer withdrew his consent after the interview and was thus excluded from evaluation.

Twenty-five interviews were conducted face-to-face at the participant's place of work, followed by a tour of the stables and premises and five interviews were conducted by telephone only. Interviewees were asked if they would consent to the discussion being recorded on a smartphone and 25 participants allowed this. The other five interviews were recorded in written form. During one interview technical problems with the recording device required to switch from voice recording to a written protocol. The majority of interviews lasted between 45 minutes and one hour. The recorded interviews were uploaded into the Amberscript software (Amberscript, Amsterdam, Netherlands), which was used to transcribe the qualitative data. The transcript or written protocol was then emailed to the interviewees for validation, allowing the interviewees to ensure that their comments had been fully understood and correctly transcribed. Some changes to individual transcripts were requested and adopted. Analysis of the transcripts was initiated only after written approval had been obtained.

Initially some closed questions were utilised to establish the participants role, formal education and experience and the number of horses in training. The subsequent questions were open-ended but all interviews followed the same pre-determined list of questions and areas for discussion (see supplementary material) ensuring topics were coverered consistently with no discrepancy among interviewees. The nature of the interviews, however, also allowed some flexibility with the aim to better understand the interviewees opinions. It also allowed topics that were not on the list of questions but appeared to be interesting to the study, to be explored further. These areas included the number, qualification and recruitment of employees, interactions with owners and breeders and the future development of equestrian sports and horse racing beyond regulations for the age at the beginning of training. In

addition, some informal discussions took place with the participants during the visit of the stables and premises.

### 2.4. Analysis

Because it was not an aim of our study to make statistical inferences, quantitative data are presented in descriptive form only. Qualitative information provided on training protocols and on the occurrence of injuries was very consistent among interviewees and did not allow thematic analysis. Thematic analysis was applied to the interviewees' response to the key horse welfare questions, i.e., mimimum age horses should commence training, if young horses should be group-housed in pretraining or early training and signs indicative of horses not coping successfully with training demands or trainer expectations. After familiarization with the transcripts, all interviewee statements were coded with short descriptive labels in an Excel file. Related labels were grouped to form potential themes, which were reviewed and refined by all authors. Themes were ranked by frequency of mentions in total, but marked differentially for Warmblood, Thoroughbred and Trotter trainers. In addition to this analysis, selected representative answers are included in the results section.

## 3. Results

### 3.1. Descriptive data

Out of the 30 horse stables included, 26 were professional, profit-orientated enterprises. One Warmblood farm, one Thoroughbred yard and two Trotter yards were run by owner trainers. Out of the 10 Warmblood trainers interviewed, two had completed vocational equestrian training at the master level (*Pferdewirtschaftsmeister Reiten*), three as skilled worker/professional groom (*Pferdewirt*), three as skilled worker in agriculture (*Landwirt*) and two held university degrees in veterinary medicine and animal science, respectively. Out of the 10 licensed Thoroughbred trainers, eight had completed vocational training at the horseracing master level (*Pferdewirtschaftsmeister Rennreiten*), one was a skilled worker/professional groom (*Pferdewirt Rennreiten*), and one was a skilled worker in agriculture. Out of the 10 licensed Trotter trainers, eight had completed vocational training at the harness racing master level (*Pferdewirtschaftsmeister Trabrennsport*), one was a skilled worker in agriculture, and one held a university degree in veterinary medicine. Warmblood stallions were prepared for stallion licensing on stud farms classified as an agricultural business with these stallions being one group of horses besides broodmares, sires for artificial insemination, young horses and older horses in equestrian training. Thoroughbreds and Trotters were kept in racing yards with all horses in pretraining or training (Table 1).

In all Thoroughbred training yards and 8 out of 10 Trotter yards, pretraining began when horses were 18 months old. Two Trotter trainers reported starting when horses were 12 and 30 months old, respectively. Preparation of Warmblood stallions for licensing began at an age of 29 to 30 months. The duration of pretraining was three to four months for Warmblood stallions, Thoroughbreds and Trotters. Horses worked between three and six days per week and pretraining sessions lasted between 30 and 45 minutes per day (Table 1).

From the start of preparation for licensing or transfer to a racing stable, young Warmblood stallions, Thoroughbreds and Trotters were kept in individual boxes at 29 out of 30 training stables. One Trotter trainer kept young horses in groups during pretraining. In all Warmblood stables and in most training yards, the horses in individual boxes had contact with neighbors through bars between the boxes. In three racing stables, the boxes had solid walls on all sides and horses only had visual contact with horses on the other side of the stable aisle through the upper half of the box door. According to the interview participants, horses were given daily free exercise in a paddock or on pasture. For Thoroughbreds, free exercise was sometimes provided in groups (≥ two horses), but not for stallions. Warmblood stallions were only allowed free exercise in individual paddocks. Trotters were given free exercise in groups but separated by sex. A group constituted of a minimum of two horses and on average Trotter groups consisted of 6 horses, where detailed numbers were given. According to the trainers, only Trotter stallions showing aggressive behavior were placed in individual paddocks. The duration of daily free movement was one to two hours for Warmblood stallions and Thoroughbreds and up to 12 hours for Trotters, with considerable differences among training stables.

In all but two training yards or farms, the horses were generally kept on straw. Only in one Warmblood farm, all horses were kept on straw pellets (reason: easier work, less manure) whereas one Thoroughbred stable kept all horses on wood chippings (reason: difficulty in obtaining good quality straw). On all farms, however, individual horses that constantly ingested straw were kept on wood chippings with some straw

**Table 1**
Organisation of equestrian and racing establishments, horse nutrition, pretraining and training, free movement, health monitoring and monitoring of training (values for continuous variables are mean±SD and range).

| | *Breed* | *Warmblood* | *Thoroughbred* | *Trotter* |
|---|---|---|---|---|
| Organisation | Public/owner trainer | 9/1 | 9/1 | 8/2 |
| | Experience with horses (years) | 30±11 (15-55) | 20±15 (7-55) | 32±16 (14-60) |
| | Horses in establishment | 114±77 (28-300) | 34±26 (2-85) | 41±26 (6-90) |
| | Horses in (pre-) training | 18±8 (5-30) | 34±26 (2-85) | 32±20 (6-70) |
| Stable bedding | Straw* | 9 | 8 | 10 |
| | Wood shavings | 3 | 5 | – |
| Nutrition | Oats | 10 | 10 | 9 |
| | Pellets | 6 | 1 | 5 |
| | Muesli | 5 | 6 | 8 |
| | Hay | 10 | 10 | 9 |
| | Silage | 3 | – | 1 |
| | Alfalfa | – | 1 | – |
| Pretraining | Age at start (months) | 28±2 (24-30) | 18±0 – | 19±5 (12-30) |
| | Duration (months) | 2.9 ± 0.9 (2-5) | 3.3 ± 1.2 (2-6) | 5.0 ± 3.2 (2-12) |
| | Days per week | 4.8 ± 1.3 (3-5) | 6.0 ± 0.6 (5-7) | 5.2 ± 1.6 (2-7) |
| | Time per day (min) | 29±2 (25-30) | 32±10 (14-45) | 24±9 (10-35) |
| Free movement | One horse per paddock | 10 | 6 | 0 |
| | Group paddock | 0 | 4** | 10** |
| | Duration per day (hours) | 2.0 ± 1.4 (1.5-5.0) | 1.5 ± 1.3 (0.5-5.0) | 6.2 ± 3.5 (1.5-12.0) |
| Health monitoring | X-rays before pretraining | 8 | 9 | 7 |
| | X-rays before first start | –*** | 1 | 3 |
| | Regular blood counts | 4 | 5 | 2 |
| | Regular body temperature | 1 | 2 | 4 |
| Training monitoring | Record times and distance | –*** | 1 | 6 |
| | Horse fitness trackers | –*** | 1 | – |
| | Record respiratory rate | -*** | 1 | 1 |
| | Observe respiration | 10 | 10 | 9 |

* Preferred, but individual horses on wood shavings.
** Does not always refer to all horses on the farm or yard, individual paddocks for stallions.
*** Parameter not relevant for Warmblood stallions in preparation for breed registry licensing.

added for consumption. Hay was fed on 29 of the 30 farms and haylage on one farm. Hay was fed *ad libitum* or three times daily. All Warmblood and Thoroughbred trainers and 7 out of 10 Trotter trainers fed oats, while pelleted feed, muesli and supplementary feeds were added. Descriptive data are summarized in Table 1.

### 3.2. Qualitative data

#### 3.2.1. Pretraining and training

All Warmblood trainers interviewed followed a largely similar program when stallions were approximately 28 months old. Before this age stallions had only been exposed to routine procedures such as hoof trimming, deworming and vaccinations. The program included getting stallions used to handling by humans, free movement in a riding arena, showing in hand, a lunging girth, lunging without and with side reins

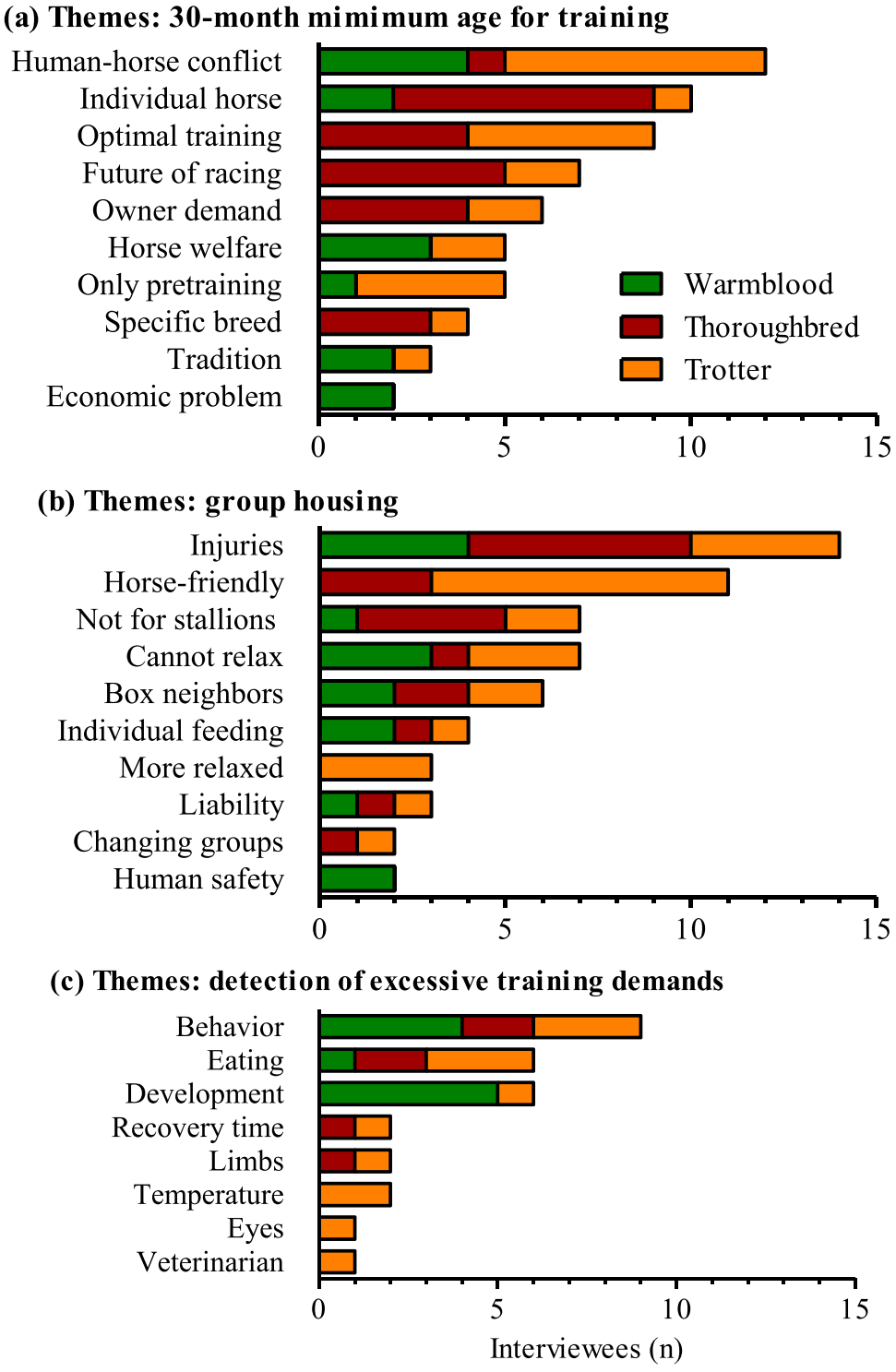


**Fig. 1.** Themes identified regarding (a) a 30-months minimum age for training, (b) group housing of young horses in training and (c) signs of excessive demands and number of statements per theme and associated frequency ranking.

and free jumping usually once a week. In addition, in many but not all farms, horses were exercised daily in an automated horse walker. The horse walker was viewed critically by two Warmblood trainers because both saw movement of the horses as too uncontrolled in the horse walker. Both trainers, however, used a horse walker but preferred to walk their horses on hand if time was available.

Pretraining of Thoroughbreds began when horses were 18 months old and was performed either in a racing yard or a pretraining stable specialized in training yearling horses. Trainers first accustomed the young horses to a bridle and lunging girth, which was then replaced by a saddle. Some trainers suggested that free movement with the girth or saddle enhances habituation of the horses. The next step was a rider to lie across the saddle followed by first mounting of a rider. First mounting of a rider often took place in the box, because trainers assumed this to be a familiar environment where horses cannot escape. In Thoroughbred training stables, the first riding and sometimes also first mounting was often done in a horse walker. Only when the horses moved safely under the rider in the horse walker after about two weeks, they were ridden in a riding arena and on a canter track. Before and after riding, horses often were warmed up and cooled down, respectively, in a horse walker. According to the interviewed Thoroughbred trainers, the first canter on a racetrack took place around three weeks after first mounting. Young horses were not exposed to fast racetrack work which was delayed until shortly before the first race as two-year-olds.

Trotters also began pretraining at the age of 18 months. Pretraining was started with a bridle and girth, often with free movement in a paddock. Then the horse was harnessed, and the trainer acted from behind with two long reins. After four to six weeks, the horses were accustomed to the sulky.

### 3.2.2. Minimal age of 30 months for training

Thematic analysis of the trainer opinions on raising the minimal age for training to 30 months identified ten themes (Fig. 1a) with an expected increase in human-horse conflicts during training addressed most frequently (12/30 trainers). This was followed by the need to respond individually to each horse's training progress and development instead of a fixed age limit (10/30 trainers), the opinion that optimal training requires starting at an early age (9/30 trainers) and a perceived risk for the future of horse-racing (7/20 Thoroughbred and Trotter trainers). The theme of demands or pressure by owners was raised by six trainers, whereas a break with tradition and ecomic issues associated with a delayed training were least frequently mentioned. In contrast to these mainly negative positions, positive effects on horse welfare were explicitly named by five respondents, mainly because young horses can spend an additional year on pasture as two-year-olds. It was also mentioned that a mimimum age for training may be irrelevant, because yearlings and two-year-olds undergo only pretraining ("*no performance-oriented, but educational training*") and regulations could not be applied in breeds selected for an early racing career ("*The 30-month rule is made for Warmbloods*").

When analysing the responses in more detail, all 10 Warmblood trainers did not oppose moving stallion licensing to winter of the stallions` second year of life or subsequent spring. The main argument against moving the licensing to the third year of life was increased conflict behavior, i.e., stallions become stronger and more difficult to handle with increasing age ("*Once they have prevailed twice, they become so self-confident that it is difficult to restore the right balance*"). Some trainers feared that licensing stallions at an increased age might lead to higher demands, including a ridden performance test. Three out of the 10 Warmblood trainers considered the stress placed on three-year-old stallions after licensing that usually includes a parallel use for breeding and competition as critical ("*The worst thing for a horse is to become a licensed sire; for him, life as a horse is over at two years*"), and a later date of stallion licensing therefore being positive for horse welfare ("*The path taken now is the right one* (and) *beneficial for the horses' development*").

None of the Thoroughbred trainers interviewed were in favor of a minimum age of 30 months for pretraining. It was repeatedly argued that Thoroughbreds have been selected for an early racing performance for over 200 years, hence a 30-month regulation derived from Warmblood training would be unjustified in Thoroughbred racehorses. They claimed that this approach would eventually result in the end of Thoroughbred breeding and racing in Germany ("*In our industry, we would have to close down and all look for new jobs*"), or stimulate owners to have their young horses trained in other European countries. Trainers also mentioned a better training response in young horses, especially better bone development in Thoroughbreds that are already trained as two-year-olds compared to a later start of training. Only one Thoroughbred trainer suggested that the classic races could still take place at the age of three, as long as they were run late in the year.

All Trotter trainers opposed to a 30-month limit for the start of pretraining but four Trotter trainers emphasized that they could take more time with young horses because the German trotting Derby, as the most important race, is only open to four-year-old horses ("*We have horses now that didn't have a chance a year ago because they simply weren't ready yet*"). By starting at the age of 18 months, young horses could be given time to develop confidence. The trainers emphasized that the physical strain for Trotters that only pull a sulky was less than for horses that carry a rider. If training was not started before horses are 30 months old, pretraining would be more dangerous and accident prone. It was also repeatedly mentioned that training at the age of two has positive effects on the horses` musculoskeletal and cardiovascular systems, which would be no longer present if pretraining and subsequent training started later. Similar to Thoroughbred trainers, some Trotter trainers assumed that a 30-month rule would lead to young Trotters being taken to neighboring countries for training.

### 3.2.3. Group housing

Except for one Trotter trainer ("*In the training yard, we try to bring young horses back into a group*"), group housing in the stable was not used by any of the interview participants. The risk of injuries due to agonistic behavior was the most frequent theme raised (14/30 trainers) with the next frequent theme being group housing named as horse-friendly (11/30 trainers) but not possible in practice because of different reasons and especially difficult for stallions (7/30 trainers; Fig. 1b). Contact to box neighbors was explicitly named as an alternative to group housing by six trainers. Relaxation of horses in group stables was named by 10 trainers but with opposite interpretations (7=less relaxed, 3=more relaxed). Least frequent responses were summarized under liability towards owners (3 trainers; "*How are you going to explain that to the owner? - Your horse is injured because I put him in the group*"), constant changes in groups which prevents formation of a solid group structure (2 trainers) and human work safety (2 trainers).

In detail, trainers suggested that group housing does not allow for individual, needs-based feeding. Furthermore, removing and returning horses from and to the group was considered to create unrest among horses. Social contact with neighboring horses through bars in the walls between boxes was viewed positively and mostly provided ("*It's relatively open, with crossbars. They can sniff and groom each other. But if one of them wants to eat in peace, he is safe in his own box*"). According to the trainers, all horses were allowed free movement every day. Trainers emphasized that the individual horse's paddocks were usually arranged in such a way that there was visual contact with horses in neighboring paddocks.

### 3.2.4. Reasons for horses dropping out of training

Thematic analysis identified behavior as the most frequent theme (9/30 trainers), followed by eating (6/30) and body development (6/30). Recovery after training was named by one Thoroughbred and one Trotter trainer. Trainers also reported pathologies of the horses' limbs, rectal temperature, the eyes of the horse or veterinary diagnoses as signs leading to dropping out of training six times and could be combined in

one theme on health (Fig. 1c).

Warmblood trainers emphasized that stallions not meeting the requirements during pretraining, were usually castrated, spent the summer of their third year on pasture and were trained as riding horses at the age of three and a half years. Trainers said that licensing is a selection procedure for future breeding sires. The decision is made by the respective Warmblood breed registries and stallions suspected not to pass the licensing were removed from pretraining and not presented to the licensing committee. The decision to remove a stallion from pretraining was, however, only made after careful assessment of the stallion, especially in animals born late in the year and therefore still developing. In some cases, these stallions were then presented at a later licensing date, e.g., with another breed registry. Thoroughbreds and Trotters that were not meeting the expectations during pretraining usually remained in the racing stable, but pretraining intensity was reduced, and these horses were not yet started in races ("*We have had horses that came to us as two-year-olds but did not run their first race until they were four*"). Only occasionally they returned to pasture again for a few weeks ("*When they come back, they sometimes work much better than if you just carry on permanently*").

Injuries and in particular lameness that required an interruption or cessation of preparation for Warmblood stallion licensing, were not reported by any of the interviewees for the horses currently in pretraining in their stables and it was suggested that health problems after pretraining were no more frequent than in other groups of horses. One trainer suggested too frequent or incorrect lunging as a potential cause of lameness. The trainers of racehorses also estimated the frequency of injuries requiring interruption of training for young horses to be low. Among the occasional problems, lesions of tendon structures were named most frequently (5 Thoroughbred trainers, 6 Trotter trainers, one Warmblood trainer). Trainers suggested that such lesions can largely be avoided by regular free movement in the paddock, careful training with a long warm-up phase, interval training with regular breaks, correct shoeing and good racetrack ground conditions. Respiratory infections were considered to occur specifically in yearlings and two-year-olds, due to contact with new horses during pretraining.

## 4. Discussion

This interview-based study collected information on current pretraining practice for young horses and the opinion of Warmblood stallion licensing trainers and Thoroughbred and Trotter racehorse trainers in Germany on a minimal age for training and on the housing of young horses in pretraining. When discussing the use and management of horses in racing and equestrian competitions, a wealth of scientific studies on optimizing the way horses are stabled exists [14–18]. There is strong evidence that stimulation of the musculoskeletal system in young horses enhances bone strength and articular cartilage development, thus reducing the risk of injuries [9–13]. In contrast, a potential mental stress of young horses during pretraining has been researched only to a limited extent [24–27]. It was therefore of interest to provide a qualitative analysis of the management of young horses in pretraining and the trainers' reasons behind their practices.

### 4.1. Descriptive data

All of the trainers interviewed were competent and had extensive experience in horse husbandry and training. Preparation of Warmblood stallions for licensing and pretraining of Thoroughbreds and Trotters followed established procedures in the respective disciplines. According to the trainers, first mounting of Thoroughbred racehorses occured either in the box or in a horse walker. Horses were then ridden several times in the horse walker before being moved to a riding arena and canter track. This appears to be different from the practice in the UK and Ireland where riding of young Thoroughbreds in a horse walker to the best of our knowledge is uncommon [28,29], although first riding steps in the horse walker have been reported [30]. Monitoring of racehorses in training with fitness trackers, supposed to record heart rate and speed of the horse was of interest for only one Thoroughbred trainer whereas the other trainers relied on observation of the horse and determination of the time needed for defined distances with a stopwatch. This reflects that commercially available equine fitness trackers have not yet become a regular monitoring tool for every day use, even though they have been validated for monitoring of training [31].

Young Warmblood stallions, Thoroughbreds and Trotters were kept in individual boxes at 29 out of 30 training stables and only one Trotter trainer kept young horses in groups during pretraining. This is largely in agreement with results from a recent survey conducted among Thoroughbred racehorse trainers in different European countries, including the UK, Ireland, France, Germany, Sweden and Belgium. In that survey, approximately 50 % of Thoroughbreds in training were able to sniff or touch nose with box neighbors and 50 % of the horses were given daily or near-daily turnout for one to two hours [32].

In all but two training yards or farms of our study, according to the trainers, horses were generally kept on straw and hay was fed ad libitum or three times daily. The continuous availability of roughage has repeatedly been shown to reduce the development of stereotypies in training yards and is therefore preferable to wood chippings or other non-digestible bedding materials [14,16,33].

### 4.2. Miminmal age of 30 months for training

Going back to regulations for mounted troops from the early 20th century [34], in equestrian sports in Germany it is customary to start training or schooling of horses when they are approximately 30 months old. The breed registries in Germany have also implemented this for licensing of stallions, without impeding the use of young stallions for breeding in their third year of life. For Thoroughbreds and Trotters, a minimum age of 30 months would delay the start of training by approximately one year. None of the trainers interviewed were in favor of this, nor did they consider it necessary. In contrast to public opinion, physiological, clinical, and epidemiological data indicate that stimulation of the equine musculoskeletal systems at a young age supports physical health and longevity, particularly by enhancing bone strength and articular cartilage development. Racehorses that enter training as two-year olds therefore have a reduced overall risk of musculoskeletal injuries [9–13]. Individual Thoroughbred and Trotter trainers participating in our study were familiar with these scientific findings. In addition to evidence for positive effects of physical activity in young horses, a recent study suggested that 18 to 30-month-old Warmblood stallions adapt rapidly not only to the physical but also to the mental demands of a pretraining program with no differences among age groups [26,27]. Thus, for young Warmblood stallions but not yet for Thoroughbred and Trotter racehorses, the opinion of the interviewees in our study is in agreement with science-based evidence. Furthermore, horses handled at an early age scored higher on learning tests than those not handled demonstrating that equine behavior can be influenced by positive interactions with humans [35].

### 4.3. Group housing

Group stabling was opposed by most, but not all interviewees, mainly due to the risk of injury caused by agonistic behavior in the group, the difficulty of individual feeding and unrest when removing and returning horses. In agreement with this opinion of interviewees, controlled studies indicate that establishing a group structure in horses unfamiliar to each other takes two to three months [36] and horses do not become accustomed to regular changes in a group [37]. Thus, the regular rotation of horses in training stables will prevent formation of hierarchies in the group and lead to disputes and stress with each rotation.

Daily free movement of horses in a paddock with sufficient size for

canter is a binding requirement for horse stables in Germany. Although according to the trainers, this requirement was met and on inspection of the premises, suitable paddocks were always available, due to the nature of our study it could not be ascertained if all horses were really given daily paddock access. In this context it should be noted that a recent survey among Thoroughbred trainers including respondents from Germany reports that currently only 50 % of Thoroughbreds in training yards have daily paddock access [32]. For the same reasons as for housing in the stable, Warmblood stallions and Thoroughbred stallions were always kept in individual paddocks with visual contact to neighboring horses whereas Trotters were often kept in group paddocks. This suggests a different approach among trainers of these different horse training sectors. Paddock turnout of Thoroughbred racehorses was the most contentious issue discussed by participants in a UK-based study. Some participants advocated turnout in individual paddocks with some socialisation with their neighbor instead of group paddocks [38]. In our study, group paddocks were seen more positive, at least for mares and geldings, but the actual practice in German training stables may be consistent with opinions in the UK Thoroughbred sector.

Irrespective of breed, the trainers interviewed in our study reported that they kept their horses on straw bedding, fed rather large amounts of hay and allowed contact with neighboring horses at least through bars in the side walls of the stalls. Internationally, racehorses are often kept on wood chippings or shredded newspaper as bedding and the stall walls in traditional racing stables are solidly built [39]. Approximately 10 to 15 % of racehorses in training stables develop stereotypies such as crib-biting, wind-sucking, weaving or box walking. The risk of stereotypies is markedly reduced by providing plenty of roughage, straw bedding and contact with box neighbors [14,16,33,40]. Regarding availability of roughage, bedding and contact with box neighbors, the opinion of our interview participants and the practice in their stables – as far as could be ascertained during a tour of the premises – is largely in agreement with science-based recommendations.

### 4.4. Pretraining and training

If individual horses were identified as not meeting the demands of preparation for stallion licensing or racehorse pretraining, the procedure for Warmblood stallions differed from that for Thoroughbreds and Trotters. Licensing was considered a selection procedure, and Warmblood stallions that did not meet the requirements, i.e., suspected not to pass the licensing, were therefore often withdrawn from pretraining, castrated, i.e., excluded from a future career as breeding sires and sold as riding horses. Thoroughbreds and Trotters that were suspected to be trained too hard usually remained in the racing stable, but pretraining intensity was reduced, and these horses were not yet started in races. The signs of excessive demands mentioned by the trainers are in agreement with scientific studies [41].

None of the trainers of Warmblood stallions reported any injuries in particular lameness requiring an interruption in the preparation for licensing. This assessment is in agreement with a recent study that followed 40 stallions throughout a 12-week preparation for licensing. Only one stallion had to be paused temporarily because of lameness, but was able to resume and complete the pretraining program [26]. Trainers of Thoroughbreds and Trotters also answered that the frequency of injuries requiring interruption or cessation of training was low in their stable. No assessment of the frequency of injuries was attempted in our study, but trainer statements on this topic must be interpreted with caution. There is evidence that the majority of injuries in Thoroughbreds occurs during training rather than racing [42]. In total, 27 % of training days were lost in two-year-old racehorses compared to 22 % in three-year old racehorses [24]. It must be considered, however, that fast galloping is not included into the pretraining program of Thoroughbreds which certainly explains a reduced occurrence of injuries associated with lameness before transition to more intensive training. In agreement with the experience of the interview participants, respiratory disease is the main cause of training days lost due to medical conditions in two-year-olds but rarely occurs at later ages [24,43,44].

In contrast to several studies on training-related pathologies in Thoroughbreds, to the best of our knowledge only limited information is available for Trotters. In Danish Trotters, pathologies of the carpal and fetlock joints accounted for most lamenesses with tendon or ligament problems accounting for only 5 % [45]. A high frequency of lameness was reported in Norwegian trotters with only 80 out of 265 three-year-old horses diagnosed as completely sound [46]. A discrepancy between these data and the assessement of participants in our study is thus evident and we suggest this can only partially be explained by the focus on pretraining and not training in the interviews of our study.

### 4.5. Limitations

In our study, data were generated from qualitative interview. These are often semi-structured to allow some flexibility, and aim at understanding experiences, perspectives, and opinions of the interviewees but a pre-determined set of questions is used. Data obtained are often non-numerical. Among the limitations of qualitative interviews as used in our study are a small sample size, potential for researcher bias, and difficulties with statistical analysis and generalization of findings [47]. In contrast to qualitative interviews, quantitative interviews are strictly structured and use pre-determined questionnaires to collect numerical data for statistical analysis. Limitations of quantitative interviews are a lack in depth, an over-simplification of complex issues, and an inability to detect nuanced perspectives [47].

Although the number of trainers interviewed in our study was limited, a sufficient number of interviewees can be assumed. This is the case when the response of the interview partners to key questions asked by the interviewer is becoming predictable [47]. This was the fact for nearly all questions in our study. In contrast, a spectrum of different answers and opinions will indicate that there is no single and largely accepted practice and that an industry or sector may be moving and open to change. Although the interviewees were not asked this question it became obvious by inference that the participants do follow current discussions on animal welfare in equestrian sports and horseracing. This will have sometimes biased their response to the interview questions. The tour of the premises after the interviews was not aimed at detailed benchmark comparisons among stables. It did, however, allow to check for obvious discrepancies between interviews and reality in the yards, especially regarding housing, feeding and general welfare.

### 4.6. Conclusions

Besides the collection of some descriptive data, this study aimed at assessing the opinion of German horse trainers on group housing of horses during pretraining, and on a minimal age for the start of pretraining. Group housing was often described as horse-friendly but was not used except by one trotter trainer. The reasons given were the risk of injury due to agonistic behavior, difficulty of individual feeding and unrest when horses are removed and returned. None of the interviewees agreed to a minimum age of 30 months for training, because this would require more intensive training at a later time, pretraining would be more accident prone and horses would not benefit from the positive effects of early training on the musculo-skeletal system. Trainers were well aware how horse welfare can be improved, but potential improvements aren't always put into practice. Scientific evidence may help the equestrian and horseracing world to change established husbandry systems and training procedures.

## CRediT authorship contribution statement

**F. Pilger:** Writing – review & editing, Investigation, Formal analysis, Data curation. **C. Aurich:** Writing – review & editing, Project administration, Funding acquisition. **J.E. Aurich:** Writing – original draft,

Methodology, Formal analysis, Conceptualization.

## Declaration of competing interest

The authors declare no conflict of interest.

## Acknowledgements

Funded by the Federal German Ministry of Agriculture, Food and Regional Identity (BMLEH) based on a decision of the Parliament of the Federal Republic of Germany and granted by the Federal Office for Agriculture and Food (BLE; grant number 2821HS016).

## Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jevs.2025.105736.

## References

[1] Campbell MHL. An ethical framework for the use of horses in competitive sport: theory and function. Animals 2021;11:1725. https://doi.org/10.3390/ani11061725.
[2] International Equestrian Federation (FEI). Public attitudes on the use of horses in sport: survey report (November 2022). https://equinewellbeing.fei.org/assets/documents/Results%20of%20General%20Public%20Survey%20-%20%20Equine%20Ethics%20and%20Wellbeing%20Commission%20Report%202022.pdf; 2022. accessed 4 June 2025.
[3] Heleski C, Stowe CJ, Fiedler J, Peterson ML, Brady C, Wickens C, MacLeod JN. Thoroughbred racehorse welfare through the lens of 'social license to operate' - with an emphasis on a U.S. perspective. Sustainability 2020;12:1706. https://doi.org/10.3390/su12051706.
[4] Jones E. Former olympic champion's animal welfare charges dropped – and 'touching' training method banned. Horse and Hound; 2023. 23 March, https://www.horseandhound.co.uk/news/ludger-beerbaum-animal-welfare-charges-dropped-touching-banned-819819. accessed 14 July 2025.
[5] Slot O. The dujardin scandal, and a sport in crisis over welfare. The Times; 2024. p. 10–1. 28. Sept, https://www.thetimes.com/sport/olympics/article/charlotte-dujardin-dressage-horse-welfare-7lwljvjc5.
[6] Wehrmann D. Die neuen Leitlinien und die Körungen der Zukunft – Interview mit Dr. Klaus Miesner (The new guidelines and future stallion licensing – an interview with Dr. Klaus Miesner; in German). St. Georg, 2021. https://www.st-georg.de/news/zucht/leitlinien-und-koerungen/ accessed 18 April 2025.
[7] Armytage M. The landmark german law that has the future of horse racing at stake. The Telegraph; 2024. https://www.telegraph.co.uk/racing/2024/05/29/landmark-german-law-that-has-the-future-of-horse-racing/. accessed 29 May 2024.
[8] Berry E. German two-year-old training permitted under exemption. Throroughbred Daily News; 2024. https://www.thoroughbreddailynews.com/pdf/tdn/tdn240529e.pdf. accessed 6 April 2025.
[9] Tyler CM, Golland LC, Evans SL, Hodgson DR, Rose RJ. Skeletal muscle adaptations to prolonged training, overtraining and detraining in horses. Eur J Physiol 1998;436:391–7. https://doi.org/10.1007/s004240050648.
[10] van Weeren PR, Firth EC, Brommer H, Hyttinen MM, Helminen HJ, Rogers CW, DeGroot J, Brama PAJ. Early exercise advances the maturation of glycosaminoglycans and collagen in the extracellular matrix of articular cartilage in the horse. Equine Vet J 2008;40:128–35. https://doi.org/10.2746/042516408X253091.
[11] Rogers CW, Bolwell CA, Gee EK, Rosanowski SM. Equine musculoskeletal development and performance: impact of the production system and early training. Anim Prod Sci 2020;60:2069–79. https://doi.org/10.1071/AN17685.
[12] Tanner JC, Rogers CW, Firth EC. The association of 2-year-old training milestones with career length and racing success in a sample of thoroughbred horses in New Zealand. Equine Vet J 2012;45:20–4. https://doi.org/10.1111/j.2042-3306.2011.00534.x.
[13] Kim W, McArdle BH, Kawcak CE, McIlwraith CW, Firth EC, Broom ND. Histomorphometric evaluation of the effect of early exercise on subchondral vascularity in the third carpal bone of horses. Am J Vet Res 2013;74:542–9. https://avmajournals.avma.org/view/journals/ajvr/74/4/ajvr.74.4.542.xml.
[14] McGreevy PD, Cripps PJ, French NP, Green LE, Nicol CJ. Management factors associated with stereotypic and redirected behaviour in the thoroughbred horse. Equine Vet J 1995;27:86–91. https://doi.org/10.1111/j.2042-3306.1995.tb03041.x.
[15] Christensen JW, Ladewig J, Søndergaard E, Malmkvist J. Effects of individual versus group stabling on social behaviour in domestic stallions. Appl Anim Behav Sci 2002;75:233–48. https://doi.org/10.1016/S0168-1591(01)00196-4.
[16] Waters AJ, Nicol CJ, French NP. Factors influencing the development of stereotypic and redirected behaviours in young horses: findings of a four-year prospective epidemiological study. Equine Vet J 2010;34:572–9. https://doi.org/10.2746/042516402776180241.
[17] Søndergaard E, Ladewig J. Group housing exerts a positive effect on the behaviour of young horses during training. Appl Anim Behav Sci 2004;87:105–18. https://doi.org/10.1016/j.applanim.2003.12.010.
[18] Lesimple C, Gautier E, Benhajali H, Rochais C, Lunel C, Bensaïd S, Khalloufi A, Henry S, Hausberger M. Stall architecture influences horses` behaviour and the prevalence and type of stereotypies. Appl Anim Behav Sci 2019;219:104833. https://doi.org/10.1016/j.applanim.2019.104833.
[19] Zollinger A, Wyss C, Bardou D, Bachmann I. Social box: a new housing system increases social interactions among stallions. Animals 2023;13:1408. https://doi.org/10.3390/ani13081408.
[20] Flamand A, Zellenka C, Mos J, Starczan A, Polak A, Petit O. Neigh-bours: why every young horse needs good friends. A pilot study during the breaking-in period. Appl Anim Behav Sci 2024;272:106190. https://doi.org/10.1016/j.applanim.2024.106190.
[21] Turcotte GK, O'Sullivan TL, Spence KL, Winder CB, Greer AL. Exploring the operational logistics of implementing isolation protocols at equestrian facilities. Prev Vet Med 2025;242:106592. https://doi.org/10.1016/j.prevetmed.2025.106592.
[22] Federal Ministry for Food and Agriculture (BMEL). Tierschutz im Pferdesport - Leitlinien zu umgang mit und nutzung von Pferden unter tierschutzgesichtspunkten (Animal welfare in equestrian sports - guidelines on the use of horses under animal welfare aspects, in German). Bonn, Germany. https://www.bmel.de/DE/themen/tiere/tierschutz/tierschutz-pferdesport.html; 2020. accessed 20 April 2024.
[23] Heinrich C. Rennerfolge zwei- und dreijähriger Vollblutpferde - ein Vergleich Deutschland versus Großbritannien und Irland (Racing success of two-year-old and three-year-old Thorougbred horses – a comparison of Germany versus the UK and Ireland). Vienna, Austria: University of Veterinary Medicine; 2024. https://phaidra.vetmeduni.ac.at/o:4270.
[24] Dyson PK, Jackson BF, Pfeiffer DU, Price JS. Days lost from training by two- and three-year-old thoroughbred horses: a survey of seven UK training yards. Equine Vet J 2008;40:650–7. https://doi.org/10.2746/042516408X363242.
[25] Holtby AR, McGivney BA, Browne JA, Katz LM, Murphy KJ, Hill EW. Variation in salivary cortisol responses in yearling thoroughbred racehorses during their first year of training. PLoS ONE 2023;18:e0284102. https://doi.org/10.1371/journal.pone.0284102.
[26] Pilger F, Kroschel L, Aurich J, Nagel C, Hoffmann G, Hartmann U, Aurich C. Stress response of 18-, 24- and 30-month-old sport horse stallions to a pretraining programme. Animal 2024;18:101373. https://doi.org/10.1016/j.animal.2024.101373.
[27] Kroschel L, Pilger F, Aurich J, Nagel C, Aurich C. Group housing increases alertness and social interaction compared to traditional single stabling in two-year-old sport horse stallions during pretraining. Animal 2025;19:101584. https://doi.org/10.1016/j.animal.2025.101584.
[28] Curragh Racecourse (Anonymous), Dick Brabazon on pre-training racehorses. https://www.youtube.com/watch?v=mBSnSJZ3lig; 2025. accessed 17 April 2025.
[29] Godolphin (Anonymous), first steps. https://www.youtube.com/watch?v=BrexMqvAWbY; 2025. accessed 17 April 2025.
[30] Murphy J. Innovative use of an automated horse walker when breaking in young horses. J Appl Anim Welf Sci 2008;11:228–31. https://doi.org/10.1080/10888700802100991.
[31] Ter Woort F, Dubois G, Tansley G, Didier M, Verdegaal E-L, Franklin S, van Erck-Westergren E. Validation of an equine fitness tracker: ECG quality and arrhythmia detection. Equine Vet J 2023;55:336–43. https://doi.org/10.1111/evj.13565.
[32] Khan P. European thouroughbred racehorse practices – a summary of the findings of our survey. Trainer Magazine; 2025. p. 56–65. https://trainermagazine.com/issues-to-read-online/october-december-2025-issue-91/2025/9/12. accesssed 17 November 2025.
[33] Albright JD, Mohammed HO, Heleski CR, Wickens CL, Houpt KA. Crib-biting in US horses: breed predispositions and owner perceptions of aetiology. Equine Vet J 2009;41:455–8. https://doi.org/10.2746/042516409X372584.
[34] Anonymous. Reitvorschrift HDV 12 (Riding Manual), 18.8.1937 (in German). Reprint. Herford, Germany: mittler; 1983.
[35] Heird JC, Lennon AM, Bell RW. Effects of early experience on the learning ability of yearling horses. J Anim Sci 1981;53:1204–9. https://doi.org/10.2527/jas1981.5351204x.
[36] Briefer Freymond S, Briefer EF, Niederhäusern RV, Bachmann I. Pattern of social interactions after group integration: a possibility to keep stallions in group. PLoS ONE 2013;6:e54688. https://doi.org/10.1371/journal.pone.0054688.
[37] Christensen JW, Søndergaard E, Thodberg K, Halekoh U. Effects of repeated regrouping on horse behaviour and injuries. Appl Anim Behav Sci 2011;133:199–206. https://doi.org/10.1016/j.applanim.2011.05.013.
[38] Butler D, Valenchon M, Annan R, Whay HR, Mullan B. Living the 'best life' or 'one size fits all' - stakeholder perceptions of racehorse welfare. Animals 2019;9:134. https://doi.org/10.3390/ani9040134.
[39] MacTaggart G, Waran N, Phillips CJC. Identification of thoroughbred racehorse welfare issues by industry stakeholders. Animals 2021;11:1358. https://doi.org/10.3390/ani11051358.
[40] Tadich T, Weber C, Nicol CJ. Prevalence and factors associated with abnormal behaviors in Chilean racehorses: a direct observational study. J Equine Vet Sci 2013;33:95–100. https://doi.org/10.1016/j.jevs.2012.05.059.
[41] Hennes N, Briant C, Lorcet C, Ruet A, Lansade L. Behaviours exhibited during training predict physical tiredness in harness trotter horses. Appl Anim Behav Sci 2024;274:106245. https://doi.org/10.1016/j.applanim.2024.106245.

[42] Verheyen KL, Wood JL. Descriptive epidemiology of fractures occurring in British thoroughbred racehorses in training. Equine Vet J 2004;36:167–73. https://doi.org/10.2746/0425164044868684.
[43] Bailey CJ, Reid SW, Hodgson DR, Rose RJ. Impact of injuries and disease on a cohort of two and three year old Thoroughbreds in training. Vet Rec 1999;145:487–93. https://doi.org/10.1136/vr.145.17.487.
[44] Lindner A, Dingerkus A. Incidence of training failure among thoroughbred racehorses at Cologne, Germany. Prev Vet Med 1993;16:85–94. https://doi.org/10.1016/0167-5877(93)90078-8.
[45] Vigre H, Chriel M, Hesselholt M, Falk-Rønne J J, Kjær Ersbøll A. Risk factors for the hazard of lameness in Danish standardbred trotters. Prev Vet Med 2002;56:105–17. https://doi.org/10.1016/S0167-5877(02)00158-7.
[46] Gaustad G, Kjaersgaard P, Dolvik NI. Lameness in three-year-old standardbred trotters – influence of parameters determined before three years of age. J Equine Vet Sci 1996;16:385–9. https://doi.org/10.1016/S0737-0806(07)80469-2.
[47] Crossman G. The organisational landscape of the English horse industry: a contrast with Sweden and the Netherlands. PhD Thesis, University of Exeter, UK, 2010. https://www.proquest.com/openview/4b2b960e5aef073eee7921c6fd017337/1?cbl=51922&diss=y&pq-origsite=gscholar.