Assessment of performance traits in breeding horses in the context of the operation of Training Stations in Poland

Ocena cech użytkowych koni hodowlanych w aspekcie funkcjonowania Zakładów Treningowych w Polsce

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Abstract

Breeders and horse trainers have long been concerned with the problem of assessing the utility value of young horses, in particular their suitability for breeding, sport and recreational uses. The purpose of use is determined by physiological, genetic and morphological factors, as well as the resulting performance traits. The actual value of the horse is reflected in many characteristics such as health status, conformation, constitution, origin, performance, and value of offspring. Therefore, extensive performance tests play a crucial role in horse breeding and methods of performance evaluation are still a subject of considerable research. Training Stations give horses a good start in their sport career. Horse training arouses the characteristics and instincts that are beneficial for the rider while suppressing others that are often unfavourable. The purpose of breaking is to make the horse acquire new behaviours and to produce the required mental state. Research to date has clearly shown that the mental characteristics of horses used for recreation and sport (and evaluated in performance tests) are highly correlated to their performance results because they are highly heritable.

Key words: estimation of utility value, performance tests, training stations

Abstract in native language

Hodowców i trenerów jeździectwa od dawna nurtuje problem wczesnej oceny wartości użytkowej młodego konia, a zwłaszcza jego przydatność do hodowli oraz predyspozycje do sportu i rekreacji. Właściwy wybór sposobu użytkowania uwarunkowany jest czynnikami fizjologicznymi, genetycznymi i morfologicznymi oraz

wynikającymi z nich cechami użytkowymi. O rzeczywistej wartości konia świadczy wiele elementów, m.in. stan zdrowia, pokrój, konstytucja, pochodzenie, dzielność oraz wartość potomstwa. Kompleksowa kontrola użytkowości odgrywa zatem zasadniczą rolę w hodowli koni, a sposoby jej oceny nadal są tematem wielu naukowych opracowań. Pobyt konia w Zakładzie Treningowym jest bardzo dobrym przygotowaniem do dalszej kariery sportowej. Trening wzbudza u zwierzęcia cechy i instynkty korzystne dla jeźdźca, a tłumi inne, często niekorzystne. Celem ujeżdżenia jest nabycie nowych zachowań i doprowadzenie konia do odpowiedniej kondycji psychicznej. Prowadzone dotychczas badania w jednoznaczny sposób wskazują na wysokie korelacje zachodzące pomiędzy właściwościami psychiki koni użytkowanych zarówno w rekreacji, jak i w sporcie wyczynowym, ocenianymi na próbach dzielności, a uzyskanymi przez nie wynikami użytkowymi, ze względu na duży stopień ich odziedziczalności.

Słowa kluczowe: próby dzielności, ocena użytkowości, zakłady treningowe

Horse selection: principles and objectives

All breeders aim to produce foals with better performance compared to their parents, which is why it is essential to know the performance of both. Performance tests at station (mares and stallions) or in the field (mares) will provide breeders with reliable and objective information about the utility value of breeding horses. Valuable genes may lie dormant and go unused because not all owners can perceive, for example, the horse's excellent movement and jumping ability, especially if he was not presented and evaluated against other animals. Evaluation of performance traits is one of the basic measures of progress in breeding warmblood horses. Because conformation (phenotype) is not always inherited in the form that we can see, special attention should be given to the animal's utility value. In order to produce a horse that has a correct exterior and excellent performance results, it is necessary to know issues related to inheritance of parental traits. At the same time, it is wrong to select raised horses only for conformation, a situation that persisted for many years in the stallion population. In this way, Polish breeders have regressed by more than ten years compared to Western breeders. Today, Poland is striving to catch up with top European breeders, but the distance is still considerable (Czarnecki 2014; Chrzanowski et al. 1999). Krzyżanowski (2009) considers that we are far behind the leading countries in the world, where breeding of sport horses is based on scientific methods of mating and selection, thus reaching an extremely high level.

Show jumpers and recreational horses currently attract most attention and there is no demand for other horses (Skoczylas 2009a). Because the purpose of use has changed, importance is attached to the utility value of horses, which is associated not only with exterior but also with mental predisposition.

Best animals that have been selected through performance tests, among others, should go into breeding (Cześnik 2009). Rivalry motivates breeders and owners to increase efforts to improve sport horses (Janicki et al. 2013a, b). Rigorous selection and consistence are essential to breeding (Cuber 2009). An animal's performance traits will only be revealed through reliable performance tests of mares and stallions (and later in professional sport). It is then highly likely that parents will transmit these traits to progeny. Although breeders never know if mating will produce the intended result in the form of a foal with desired traits, an inferior mare with poor

performance traits will rarely produce a champion even if mated to the best stallion (Wiszowaty 2006b).

Training and performance tests of young stallions and mares are conducted all over the world. In many countries they take place in Training Centres, giving preliminary guidance on the horse's utility value (www.hannoveraner.com). The main objective of performance testing is to improve breeding stock using breeding animals distinguished by strength, endurance, health, as well as specific characteristics desired for a given type, such as speed in race horses or traction power in working horses. External characteristics (such as conformation and movement) are assessed visually and conformation defects affecting performance contribute to the final score. The performance of internal organs (mainly the motor system) can be tested after exercising the horse and checking the body's response to this effort. Performance tests also test the horse's character, working ability and willingness to work.

Back in the day when most horses worked in harness as the only traction power, there was no demand for typical riding horses. The type of their day-to-day work provided an excellent opportunity to assess their character, health and performance. Today, when the breeding of ride-and-drive horses was replaced by the production of sport and riding horses, it is absolutely necessary to performance test both stallions and mares (Byszewski 2009). Lawin (2008) believes that only horses that passed performance tests should be assigned for breeding, because they will transmit desired traits to offspring. Performance tests should be conducted in such a way that the demands are appropriate to the horse's age and the evaluation method is as objective as possible (Janicki et al. 2013a, b). That horse performance tests are necessary was confirmed by Jończyk (2002), who concluded that the basic factors in selection of horses are utility value and correct conformation (evaluated both in the field and at station), which should be high enough to contribute to improving breeding progress in the horse population.

Many years ago, breeding in Poland was conducted in two directions: different rules were followed in state studs and in private centres. Both mares and stallions were selected in state studs, and almost all horses were entered in stud books and almost all stallions were approved in field breeding (Cuber and Stasiowski 2011).

After the Second World War, Poland's breeding policy was oriented towards meeting the demand for tractive force in agriculture. This goal was fulfilled by breeding ride-and-drive horses, which converted food efficiently and were suited to working on the farm and in harness (Łojek 1997).

Over the last 50 years in Poland, horses were used for completely different purposes than in the West (Pietrzak et al. 1997). For this reason, selection had a different emphasis (Wierusz-Kowalski 2008b). It was not until 1956-1963 that the first successful breeding of riding horses in post-war Poland took place at the Posadowo Stud using stallion Rumian (Nowicka-Posłuszna and Walkowiak 2003). This stallion was mated to 35 mares, which in addition to successful sport career had excellent ancestors in terms of performance or good progeny (Nowicka-Posłuszna 2000; Nowicka-Posłuszna and Liszkowski 2001; 2001a).

Recent socio-economic changes in Poland had a substantial effect on the number of warmblood horses and changing preferences of the breeders. The almost complete lack of the agricultural use of horses had the greatest influence on changing the breeding objective of warmblood horses. The native breeds of Małopolski and Wielkopolski horses, which still recently were mainly raised as ride-

and-drive horses, are slowly changing into riding horses with possible use in different forms of equitation, from recreation to professional horse riding (Budzyński et al. 1998; Pikuła 2004).

Organization of training stations

Depending on breed, sex and age, a horse subjected to utility value estimation should undergo one of the following performance tests: stationary riding test, stationary draught and riding test, field draught test, field riding test, riding sport tests, and racecourse tests, which include speed, endurance, character and health. Riding sport tests are performed in five disciplines: jumping, dressage, eventing, carriage driving, and endurance riding (Dziennik Ustaw 1999). Experts recommend that performance tests be conducted for both stallions and mares because breeding based only on evaluation of utility value precludes achieving rapid breeding progress (Jończyk 2001). Initially, only males were subjected to mandatory performance tests. Since 2012, performance testing has been obligatory also for mares and determines if an animal can be entered into the stud-book for a given breed. This is a major milestone in the breeding of Polish warmblood horses (Byszewski 2009).

In 1926, the Stud Farm in Trakehnen was the first to organize a Training Centre for stallions. At one time, around 80 stallions (40 Trakenher stallions and 40 stallions of other breeds, purchased from private breeders) were trained and performance tested. Training began in October and lasted one year. Stallions were accepted at 2.5 years of age and left the centre as 3.5-year-olds. In the autumn and winter, stallions were broken under saddle and worked in harness pulling sulkies and light carts. In May, the stallions began to be trained outdoors where they worked in teams and accustomed themselves with outside riding across different routes. They were gradually accustomed to field gallop (from around 500 to 700 metres per minute) and to overcoming small artificial and natural obstacles. During the summer months, the gallop distance was gradually increased. In September, the stallions each time covered 10-15 km at a gallop. In October, the year-long training ended with a 3-day test. On the first day of the performance test, every stallion had to individually cover 10 km at a field gallop and overcome 8-10 different types of medium difficult obstacles at 350 metres per minute. On the second day, every stallion covered the same route in a different area. On the third day, the distance was increased to 13 km with 10 obstacles, ending with a 500 m gallop at 700 metres per minute. On the fourth day, the stallions were visually examined to evaluate conformation, type, movement, origin, condition after the test, and results of the test. A stallion that completed his year-long stay at the Training Centre received a certificate which detailed his advantages and disadvantages and described how he endured the hardships of training. Some of these data appeared in the volumes of the “Ostpreussisches Hengstbuch”, published during 1927-1942. The stallions that passed the test were put out to stud, and those that failed the performance test were castrated and used as general-purpose horses.

When organizing training stations, Polish horse breeders followed the example of the Trakehnen Training Centre (www.hannoveraner.com). Poland’s first training station at the Kozienice Stud was established in 1936 and operated until the mid-1990s. It subjected 3-year-old stallions to an 11-month saddle and carriage training, which was based on the Hanoverian Association standards. The goal of the training was to develop a ride-and-drive horse prepared to work under saddle and in harness.

The training took place from October to the next September and ended with a three-day performance test of the saddle and carriage type. The Training Station was to accomplish two principal objectives: to rear young stallions properly by providing them with optimum conditions in the final stages of body development while ensuring thorough control of whole body efficiency; and to develop and consolidate desirable breed characteristics, and thus to increase their ability to transmit these characteristics to the next generation. In the final performance test, the saddle test was to show courage as well as heart, lung, tendon and muscle performance, while the carriage test showed the character, ability and willingness to work in harness. The training and performance test programme was arranged along these lines. On the first day, stallions were tested for correct breaking under saddle. They were presented in teams under saddle at three basic gaits (the walk, the trot and the canter). Next, they individually traversed a course of natural obstacles in order to show their jumping ability. In the afternoon, the stallions took carriage tests, which were aimed to show their character and carriage ability through a 1-km trot in sulkies and through a 0.5-km walk, pulling a one-wheel cart with a load twice as heavy as the horse. This included the weight of the cart, the load, the coachman and his assistant. On the second day, stallions standing in a team behind the leader took part in a 12-km gallop (350 metres per minute) with solid obstacles around 1 m high. On the third day, there was a 15-km gallop with 15 obstacles. These gallops tested the efficiency of the circularity and respiratory systems and of tendons and muscles. As a result of these performance tests, only 5% of the tested stallion population was culled, mainly due to lameness. In 1961, two changes were introduced to performance testing. The presentation of stallions in teams was replaced with individual dressage arena test, whereas two long-distance races of 12 and 15 km were replaced with two steeplechases of 3 km under the weight of 70 kg at one- or two-week intervals. After 23 years of holding steeplechases it turned out that they are conducive to injuries of ligaments and tendons, which severely reduced the value of stallions as general-purpose horses. For this reason, another change in the performance tests of warmblood stallions was introduced in 1984. Steeplechases were replaced with an individual field test in which two 2.5-km cross-country tests (500 m/min) with 10 obstacles were held one moth apart, each cross ending with a 500-m gallop at 700 m/min. Trotting in sulkies was replaced with trotting in one-horse carts. This change was introduced because sulkies could not be repaired, and account was made of work safety and hygiene. The programme, in effect from 1984 to 1997, still followed the example of the Trakehnen Stud and was based on thorough saddle and carriage tests. Performance test results were divided into three characteristics: general (max. 30 pts), draught (max. 30 pts) and riding (max. 40 pts). In 1997, these characteristics changed again to: general (20 pts), draught (30 pts), riding (50 pts). The final set of characteristics was as follows: general (20 pts), draught (20 pts), riding (60 pts). These changes were introduced to increase the importance of riding characteristics. The general characteristics included character, health, feed conversion, and aptitude for training. Draught characteristics were represented by a 1-km trot in a cart, a 0.5-km walk in a cart, the obedience and pulling test in which the horse is pulling 150% of his own weight in front of and behind semi-rough sand, as well as starting at a walk. Riding characteristics included free jumping, a test in the dressage arena, jumping under rider on the track, and a training test.

The duration of training at the Training Station also underwent gradual changes required by the market and breeding trends. The late 1990s was a short period when the stallions were first subjected to a 100-day saddle training ending with a preliminary performance test, and some of them underwent an 8-month saddle training ending with performance test proper. During that time, the Training Stations were located in Kwidzyn, Sopot, Biały Bór and Bonin. Before 2013, stallions were subjected to a 100-day saddle training (first in Biały Bór and Bogusławice, and later in Bogusławice only), during which the station's manager evaluated the following on a 10-point scale: character, temperament, aptitude for training, three basic gaits under rider, free jumping, and jumping under rider. Likewise, a 3-person committee also evaluated three basic gaits under rider, free jumping and jumping under rider. In 2002, the point scoring of stallions was replaced with the index method and foreign riders specializing in dressage and jumping tested the stallions for rideability (or how cooperative the horse is), suitability for dressage, and suitability for jumping. Three indices were determined: general, dressage, and jumping. The index value depended on the weighting of a trait and the average of a trait. In the years 1998-2006, tests after the 100-day test did not include the field test. It was reinstated in 2007 to include a distance of 2.5 km at 500 m/min with 5 natural solid obstacles. Another change to stallion performance testing was made in 2013 when the scoring method was brought back. After 11 years in effect, the index method was withdrawn because the population of stallions that were evaluated in training stations over the last two years was too small. From 2014 onwards, the licensing of stallions will be combined with a field performance test.

Prospects for further objectivization of utility value estimation in horses

According to Huizinga et al. (1990), genetic correlations for jumping and the high correlation between rideability and gaits make the performance test results essential and useful in deciding whether a horse should be bred for jumping or dressage. What is important is that performance tests enable mares and stallions to be evaluated before they are used in breeding. Access to understandable and comparable results is of particular importance due to the increasing trade in semen. It is essential that the results of young horses can be compared with their sport results and their interrelationships are evaluated (Hellsten et al. 2006). Hellsten et al. (2006) listed different tests used to evaluate young horses for dressage and jumping and compared the results obtained by the horses to determine selection efficiency of particular tests. All the analysed tests consistently confirmed that performance tests are highly heritable and strongly correlated to sport results. Therefore, it is crucial that the Polish Horse Breeders Association and the Polish Equestrian Federation should closely cooperate and exchange data, which is still far from satisfactory. Also Cuber and Zagrodzka (2005) believe that performance test results should be widely available and comparable, because the tests are the most important stage of selection during which all abilities and predispositions are examined.

Pałczyński (1998) holds that for performance tests to be an effective selection tool, all foals, mares and stallions representing a given breed should be assessed and qualified by one commission of very good specialists who are experts on the breed. The performance testing system should be modified so as to reduce the number of evaluated parameters while increasing the level of selection criteria (Kaproń et al. 1996). More and more attention is given to mental traits of animals,

which determine the degree of their nervous excitability. Subjective assessment of horse character during stationary performance tests is a substitute for estimating the suitability for riding in terms of mental traits. Budzyński et al. (2001) showed statistically significant correlations between the scores for character and performance test results of stallions in Training Stations. Stallions that received lowest scores for character were also ranked lowest in riding tests. The present author (Drewka, 2012) also confirmed a direct proportional relationship between the score for character and the final score of mares in the stationary performance test. It is therefore necessary to more accurately assess the nervous excitability of horses due to the high correlations between horse behaviour and performance test results (Sapuła et al. 2005). Nervous excitability of horses was evaluated by many authors, including Budzyński et al. (1989), Brzeski (1996) and Sapuła et al. (2002; 2003). All of them demonstrated significant correlations between the level of nervous excitability and performance test results of stallions in training stations (Budzyński et al. 2001). The tests used to assess excitability provide evidence that the nervous system is related to performance traits of horses (Kaproń 1999), while their behaviour parameters should be taken into account when selecting for sport and recreation (Visser et al. 2000). The possible evaluation of character during performance testing appears to be of practical use as regards further use of the horses.

When comparing Wielkopolski and Małopolski stallions, Budzyński et al. (1995) found a higher proportion of unstable horses in the Małopolski breed, which the authors attribute to the presence of pure Arabian horse blood, characterized by high nervous excitability. Meanwhile, Ignor et al. (1999) and Ignor and Janiszewska (2003) reported a highly significant and positive correlation between the degree of stallion stability before and after training, which confirms the positive effect of training on the degree of nervous stability in young stallions. The high interindividual and breed differences make it possible to select animals with desirable mental traits.

There is an urgent need to develop an objective and comparable method of estimating the utility value of horses in Poland (Kaproń 2001b, 2006). Szarska and Cywińska (2009) report that although the commonly used performance tests have the advantage of early horse evaluation, their great disadvantage is that they are unobjective because they are based on subjective evaluations of judges and managers of Training Stations. The same authors believe that efforts should be made to evaluate changes in the horse's body during exercise, because the parameters judged during performance tests are unrelated to the horse's physical capacity. These changes depend on the degree of training and adaptation to working under conditions of increasing fatigue. Studies conducted on the basis of stallion performance tests indicate that the score for body capacity should be included in the evaluation sheet, because clear differences were observed between current evaluation of stallions and their evaluation based on capacity. A similar standpoint is taken by Budzyński et al. (1998), who stress that one drawback to the evaluation of horses based on performance tests is that they are based exclusively on subjective visual assessment and that individual characteristics are scored without measuring the evaluated traits. In turn, Kaproń et al. (2003c) point out that qualitative assessment of the horse's motor predispositions by a panel of judges will always be unobjective despite the professionalism and goodwill of the judges. Meanwhile, quantitative parameters of horse movement can be easily determined by physical methods. The current performance testing system fails to account for quantitative

assessment of the motor parameters of horses evaluated in Testing Stations or by field tests.

Kaproń et al. (2001a) suggest that to determine the horse's response to training, performance tests should also incorporate the indicators of training progress evaluated from pulse measurement.

As a new tool for analysing horse movement, Kolstrug and Pierzchała (2008) propose the digital format, which will enable horse jumping parameters during performance tests to be evaluated and determined. Computer image analysis is a reliable method for assessing jumping parameters and for this reason it may help when evaluating horses during performance tests. Lewczuk (1996, 1998) investigated the technological and methodological basis of computer image analysis as a way to assess riding performance and sporting ability in horses. She observed that the chosen measurements reflect the differences in jumping ability and jumping style, which makes it possible to identify horses with top sporting abilities.

Conclusions

Early and thorough performance testing of young animals plays a crucial role in horse breeding. The principal objective of performance tests is to improve breeding stock. The testing systems should be modified so as elaborate objective methods for analysing the utility traits of these animals. Training Stations help to prepare and select horses for their sport career by instilling new behaviours in horses and by addressing their mental condition. Training has a positive effect on nervous balance in horses.

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