Influence of reproductive status, age and personality of horses on achievement of full athletic potential in showjumping competitions

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Abstract

The study analysed the results of showjumping competitions of 41 warmblood horses of varying reproductive status, age and personality. In total, 8 stallions, 18 mares, and 15 geldings were included. Horses were divided in the following age groups: young horses 4-7 years old (n=15), mature horses 8-13 years old (n=13) and older horses 14-20 years old (n=13). Horses were also divided according to dominant personality component, obtained by questionnaires: excitability (n=4), protection (n=7), sociability (n=15), curiosity (n=9), horses without a dominant personality component (n=6). Horses in this study were compared to the results of showjumping competitions of the Croatian Equestrian Federation in the past two consecutive years, considering data from 80 classes, 44 tournaments and 3280 starts. The Winter Cup (1.10-1.3) was considered the time of absence of cyclicity in mares while the Summer Cup (1.3-1.10) was considered the full season of reproductive cyclicity of mares. The aim of the study was to determine correlations between the dominant personality component, reproductive status and age of the horse in obtaining optimal results in showjumping competitions. Based on the results, the dominant personality component positively influences the horse's success in showjumping (ranking, penalties). Excitable horses had the poorest results, especially during the reproductive season (P<0.05). Protective horses had the best results regardless of season. It is likely that determination of the dominant personality component could help in better selection of showjumping horses. Geldings had the least seasonal variations, while mares had significantly better results out of season (P<0.05). Stallions also had better results out of season, though the difference was not statistically significant. Recommendations include introducing methods of cycle blockage in mares to improve focus and results in all categories. Contrary to expectations, older horses

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(14-20 years old) obtained better results than mature horses (8-13 years old). Further research of all observed parameters on a significantly higher sample of showjumpers is required to determine whether the findings here could be applied to the complete population of warmblood horses used in showjumping competitions in Croatia and abroad.

Key words: *warmblood horses; showjumping competitions; horse personality; blockage of cyclicity in mares*

Introduction

Showjumping is one of five equestrian sport disciplines performed on horseback united in the Croatian Equestrian Federation. According to showjumping regulations, as of 1 April 2019, the goal of the competing pair (horse and rider) is to complete the parkour of 10-13 obstacles that are not fixed with the least possible penalties, preferably without any, and in the fastest possible time (Figure 1). Faults are incurred for each knockdown, as for any show of noncompliance or indiscipline, for example if the horse refuses to make the jump or stops just before a fence (Figure 2). Each jumping penalty for a refusal or knock-down adds four points to the opponents score. The winner is the pair with the lowest score in the fastest time.

Horses can start competing at 4 years old and if they are healthy, and could be maintained in competitions until their twenties. Geldings and mares are used mostly, though stallions are also ridden. Selection of the competition level depends on the knowledge and skill of the rider and the capability of the horse. All results of showjumping competitions are publicly available on the official website of Croatian Equestrian Federation.

Horses of different age, reproductive status and personality are in direct con-

Figure 1. Gelding, 13 years old, jumping over an obstacle at 1.35 m in competition (private archive, Tonija Kekez)

Figure 2. Mare 7 years old refuses to jump the fence at 1 m in showjumping competition (Private archive, Tonija Kekez)

tact in the warm-up arena during preparation for competition. In order to obtain optimal results, the horse needs to be in the best possible condition but also focused on the rider's aids, and immune to distracting factors in the environment that could disturb its concentration. Although there are no scientific data to define how particular horses overcome such difficulties (new environment, interest in new and unfamiliar horses, fear of the unknown), it is well documented that different horses, no matter their age, react differently in overcoming such problems.

The aim of this study was to determine possible correlations between the dominant personality component, reproductive status and age of the horse in obtaining optimal results in showjumping competitions, that could also lead to better welfare standards. This was previously suggested by Træen and Espen (2021), but has not yet been proven.

Personality in horses was first described by Adele Sian Lloyd who developed the equine personality test (Lloyd et al., 2007). They aimed to check the credibility of equine personality evaluation using a questionnaire completed by owners, grooms or riders. The questionnaire evaluates 30 personality traits grouped in six main groups based on the dominant personality component, combined with observation of horse during 2 hours in the paddock, both let alone and in a herd of other horses, in which all interactions were recorded. Their results confirmed that the questionnaire is a valid and objective form for determining the dominant personality trait of horses (Lloyd et al., 2007).

A similar study was initially performed on working dogs. Svartberg (2002) used the published and widely accepted personality test from the Swedish Union of Working Dogs. They examined whether there were relationships between personality and the performance of dogs (*Canis familiaris*) in working dog trials. Data from 2655 dogs of the two breeds, German Shepherd dog (GSD) and Belgian Tervuren (BT), were analysed. These breeds were chosen because of indications of differences in personality between these breeds, and because both breeds are commonly trained for working dog trials. Using a factor analysis, five factors were extracted: Playfulness, Curiosity/Fearlessness, Chase-proneness, Sociability, and Aggressiveness. Further analyses showed that these factors, with the exception of Aggressiveness, were all related to one higher-order factor, which was interpreted as a shyness–boldness dimension. According to their success in working dog trials, dogs could be categorised as low, middle, or high performing. The results show that the shyness–boldness score is related to the level of performance: high-performing dogs have higher scores (i.e., are bolder) compared to low-performing dogs. This difference was significant in Belgian Tervurens of both sexes, and in female German Shepherds. In general, German Shepherds scored higher than Belgian Tervurens, and males scored higher than females. However, in well-performing dogs there were no breed or sex differences. This indicates a threshold effect: to achieve high levels in working dog trials, the dog should have a certain level of boldness, independent of breed or sex.

These results imply that a lower proportion of dogs of shyer breeds are able to reach higher performance levels, compared to dogs of breeds that generally score higher on the shyness–boldness axis. In German Shepherds, a relationship was also found between personality and age of success; bolder dogs reached success at a younger age. There were no differences in the boldness score between dogs succeeding in different types of working dog trials (tracking, searching, delivering messages, handler protection), suggesting that the personality dimension predisposes trainability in general. These results might be applied to the selection of breeding dogs in working breeds and in selecting suitable working and service dogs. A test like the one used in this study can give a description of an individual dog's personality, which also can help in matching the dog with adequate training. Although it is highly probable that such links between dominant personality trait, sex and age could also lead to differences in performance of horses, there are still no scientific data that would support this.

It is important to emphasise that showjumping competitions are organized in two seasons, i.e., the Winter and Summer Cup. The Winter Cup is organised in an indoor arena during the autumn and winter months and seasonal sexual inactivity (anoestrus) of mares, while the Summer Cup is organised outdoors and lasts during the cyclicity phase of mares. Such competition dynamics with tournaments several weekends per month is inconvenient for all horses, especially for cycling mares. Mares in oestrus are more aggressive, difficult to ride, and more often show hind leg and back pain (Jorgensen, 1996).

Furthermore, they have less concentration and are more prone to injuries because of softened ligaments due to oestrogen dominance. Pheromone secretions also distract other horses, especially stallions and other mares, but also geld-

ings (Samper, 2009). In some countries, it is acceptable and even common to have sport mares under a regime of oestrus blockage in order to obtain better results in sport and increase welfare of the mare. Mares and stallions used in showjumping competitions are also used for breeding purposes. Selection for breeding is not only based on pedigree but also on sport rankings. Mares and stallions that are difficult to handle and ride, lack good sport results and have difficulty handling stress, are not suitable for breeding. On the other hand, mares and stallions that are successfully used in sport for many years are almost always used in breeding. Mares are introduced to breeding after their sport career, since mares pregnant more than 4 months are not permitted in competitions, just as mares with foal on foot (*General Regulations of the Croatian Equestrian Federation*, 2019), resulting in the loss of two competition years per foal. In most cases, this is too long and owners are reluctant to breed the mare if she is still competing, except for assisted reproduction technology, *i.e.*, ovum pick-up (OPU) and embryo transfer. Stallions on the other hand, are routinely used for breeding and sport simultaneously. The effects of exercise on reproductive function in stallions has been studied but is not yet fully clear (Aurich and Aurich, 2008). An increasing number of stallions are entered into equestrian competitions in parallel to their breeding career. Stallions competing regularly do not differ in plasma cortisol concentrations from stallions used for breeding only.

In contrast, in stallions taking part in competitions only occasionally, cortisol concentrations were found to be elevated, though competing had no negative effect on semen quality. Mares are transported frequently during the periovulatory period and increases in plasma cortisol concentrations show that transportation is a stressful event, though it has no effect on the oestrous cycle or pregnancy rate. Stress related to the management of mares for artificial insemination (AI) increased the secretion of cortisol but did not affect reproductive function (Aurich and Aurich, 2008). They also stated the possibility that horse personality could influence their reactions and adaptation to stress.

Materials and methods

The study analysed the results of showjumping competitions of 41 warmblood horses of varying reproductive status, age and personality during two years through the Winter and Summer Cups. Horses in this study were compared to the overall results in showjumping competitions of the Croatian Equestrian Federation. In total, we analysed data from 80 classes, 44 tournaments and 3280 starts.

The Winter Cup (1 October to 1 March) is considered the time of absence of cyclicity in mares, while the Summer Cup (1 March to 1 October) is considered the season of reproductive cyclicity of mares. The Summer Cup is completely organised outdoors while the Winter Cup is organised in indoor arenas with separate warm-up areas. Statistical analysis was performed using the program STATISTICA (Statsoft, Inc. Tulsa, USA, v13.2).

In total, 8 stallions, 18 mares, and 15 geldings were included. Horses were divided into the following age groups: young horses 4–7 years old (n=15), mature horses 8–13 years old (n=13) and older horses 14–20 years old (n=13). Horses were also divided according to dominant personality component, as described by Lloyd et al. (2003) obtained by questionnaires: excitability (n=4), protection (n=7),

sociability (*n*=15), inquisitiveness (*n*=9), horses without a dominant personality component (*n*=6).

Results

Comparison of penalties was first based on the reproductive status: mares, stallions and geldings as shown in Table 1. The highest number of penalties was observed in stallions (6.9), followed by mares (4.79) and geldings (4.51). When comparing penalties between reproductive season (Summer Cup) and anoestrus season (Winter Cup), there was statistically significant difference in mares only, (4.95 *vs.* 4.32, respectively). The least variation was observed in geldings. The next observed parameter was ranking in competitions. In general, the best rankings were obtained by geldings (7.25), followed by mares (7.61). The poorest rankings were obtained by stallions (8.82). A statistically significant difference in rankings by season was present in mares, with significantly better rankings during the Winter Cup (out of season) (5.72) than the Summer Cup (reproductive season) (8.21). Geldings also obtained better rankings during the Winter Cup (out of season) (5.36) than the Summer Cup (reproductive season) (7.81).

Horses grouped by age were also compared according to average penalties and rankings as shown in Table 2. Older and more experienced horses, over 13 years had on average the least penalties (3.92), followed by horses younger than 7 years (5.22), whilst the most penalties were incurred by horses 8–13 years old (6.14). No age groups showed a significant difference in penalties when the results in

Table 1. Arithmetic mean, maximum and minimum of penalties and ranking at competitions, by reproductive status

		Stallions *N*=8	Mares *N*=18	Geldings *N*=15
Penalties MEAN (MIN – MAX)	Total	6.9 (3.18-15.00)	4.79 (1.45-8.20)	4.51 (0.00-8.57)
	Summer Cup (reproductive season)	5.72 (3.00-9.83)	4.95* (0.57-8.98)	4.72 (0-10.52)
	Winter Cup (out of season)	5.28 (0.00-10.5) (*N*=6)	4.32* (0.00-20.00)	4.29 (0.00-10.5)
Ranking MEAN (MIN – MAX)	Total	8.82 (5.75-11.83)	7.61 (3.82-10.5)	7.25 (1.00-13.10)
	Summer Cup (reproductive season)	9.57 (5.94-12.74)	8.21* (2.29-11.44)	7.81* (1.00-14.30)
	Winter Cup (out of season)	7.09 (1.00-9.00 (*N*=6)	5.72* (1.64-14.00)	5.36* (1.00-9.00)

*values in the same column differ significantly $P<0.05$

Table 2. Arithmetic mean, maximum and minimum of penalties and ranking in competitions, by horse age groups

		<7y *N*=15	8-13y *N*=13	>13y *N*=13
Penalties MEAN (MIN – MAX)	Total	5.22	4.79 (1.45-8.20)	4.51 (0.00-8.57)
	Summer Cup (reproductive season)	5.45 (3.00-9.83)	5.79 (3.15-10.52) (*N*=12)	3.75 (0.00-8.37)
	Winter Cup (out of season)	3.62 (1.29-5.50) (*N*=13)	4.02 (0.00-9.40)	5.71 (0.00-20.00)
Ranking MEAN (MIN – MAX)	Total	8.50 (5.75-13.10)	7.47 (4.49-10.5)	7.07 (1.00-11.76)
	Summer Cup (reproductive season)	9.10* (5.94-14.30)	8.24* (4.43-11.44) (*N*=12)	7.42 (1.00-11.90)
	Winter Cup (out of season)	5.39* (2.43-8.00) (*N*=13)	6.08* (2.00-15.00)	5.91 (1.00-14.00)

*values in the same column differ significantly $P<0.05$

the Winter and Summer Cups were compared (i.e., reproductive v. off season). The best rankings had horses older than 13 years (7.07), followed by horses 8–13 years old (7.47). The poorest ranking was obtained by horses younger than 7 years (8.50). Although reproductive season did not significantly influence the differences in penalties between the age groups, it did significantly influence ranking. A statistically significant difference was present in young horses that had significantly better rankings out of season (5.39) compared to in the reproductive season (9.10), and this was also observed in horses 8–13 years old (6.08 out of season vs. 8.24 reproductive season).

The third division of horses was made according to dominant personality component as shown in Table 3. Of the six personality components, horses in this study were grouped into four personality components. Domination and anxiety were not present in any of the observed horses as the dominant personality component, since such horses are unsuitable for showjumping competitions. Four horses were categorised as dominantly excitable, seven as protective horses, 15 as sociable horses, and nine as predominantly curious horses, while for six horses it was not possible to determine the dominant personality component due to owner reluctance to complete the questionnaire, Predominantly excitable horses had on average the most penalties (8.23) compared with predominantly curious (5.62) and sociable (4.51), while the least number of penalties were recorded by protective horses (3.49). It is interesting that the highest number of penalties during the reproductive season were recorded

Table 3. Arithmetic mean, maximum and minimum of penalties and ranking in competitions, by dominant personality component

		excitable *N*=4	protective *N*=7	sociable *N*=15	curious *N*=9
Penalties MEAN (MIN – MAX)	Total	8.23 (4.70-15.00)	3.49 (1.45-4.63)	4.51 (0.00-8.13)	5.62 (3.18-8.57)
	Summer Cup (reproductive season)	7.15 (4.83-9.83) (*N*=3)	3.39 (0.57-4.51)	4,64 (0.00-8.98)	6.06 (3.00-10.52)
	Winter Cup (out of season)	3.53 (0.00-7.00) (*N*=3)	4.09 (0.75-10.00)	4.18 (0.00-20.00)	4.36 (1.33-9.00)
Ranking MEAN (MIN – MAX)	Total	8.90 (7.00-11.83) (*N*=3)	6.73 (3.82-9.79)	7.19 (1.00-10.50)	8.90 (4.49-13.10)
	Summer Cup (reproductive season)	10.01 (8.55-11.83)	6.95 (2.29-11.00)	7.70* (1.00-11.44)	9.70* (4.43-14.30)
	Winter Cup (out of season)	7.55 (2.00-15.00) (*N*=3)	5.70 (4.74-6.50)	5.54* (1.00-14.00)	5.59* (2.00-9.00)

*values in the same column differ significantly $P<0.05$

for excitable horses (7.15) compared with horses with other dominant personality component, and this was much higher than in out of season competitions (3.53). The best rankings were achieved by protective horses (6.73), followed by sociable horses (7.19), curious horses (8.90) and the poorest rankings by excitable horses (8.90). There was a statistically significant difference in rankings between the reproductive season (7.70) and out of season (5.54) in sociable horses, and also in curious horses that had poorer rankings in the reproductive season (9.70) compared to out of season (5,59).

Discussion

The aim of this study was to determine whether different reproductive categories, age and personality types of horses that are under the influence of sex hormones, pheromones and other stimuli, are intrusive factors that influence results (penalties and rankings) in showjumping competitions. Horses in showjumping competitions are stabled in temporary boxes next to unfamiliar horses, they are in close contact during warm-up and competitions, and this can affect them via different stimuli and means of communication, partially involving reproductive reflexes and behaviour (pheromones, olfactory, visual and vocal stimulants).

There is also a strong influence of season, since showjumping competitions take place year round. During the Winter Cup (autumn and winter), mares are in winter anoestrus while during the Summer Cup (spring and summer), mares

are in cycle and there is always a mare in heat. Since the majority of mares participating in showjumping competitions in Croatia are not routinely place on cycle blocking methods, there is a mixture of mares in heat, young stallions, geldings and other horses at the same competition venue. These horses are also transported to the competition site, so transportation stress is combined with the positive stress of meeting new animals of preferable traits for some horses (Waran, 2003; Merkies and Franzin, 2021).

Research on working dogs had shown that dog reactions to new environment, interactions between individual dogs, pray instinct, etc., largely depend on the dominant personality component of an individual dog (Svartberg et al., 2002). Similar research performed by Lloyd et al. (2007) on an equine population of different breeds and breeding types used for recreation in the United Kingdom showed that the personality questionnaire is a scientifically relevant and accurate method of determining the dominant personality trait for horses. In this study, we adapted the questionnaire to horses used for showjumping competitions, in order to determine whether the dominant personality component influences performance in horses, as in working dogs. In this study, of the six dominant personality components (domination, anxiety, excitability, protection, sociability, curiosity) as described by Lloyd et al. (2007), we found horses with only four dominant personality component, since none of the horses was anxious nor dominant. For centuries, horses used for showjumping have been strictly selected to be brave and docile, and considering that the study of Lloyd et al. (2007) included a range of different types of horses, this is an expected and acceptable difference. Showjumpers are in general less excitable and less interested in new objects than dressage horses (Hausberger et al., 2011). This was confirmed here, since only 10% of observed horses (four in total) had excitability as their dominant personality component. It is interesting that those horses also had the highest overall number of penalties, especially during the reproductive season. It also confirms that excitability as a dominant personality component is an undesirable trait in showjumpers, not only because of the simplicity of handling and training, but also for their competing results and efficiency. These horses not only had the most penalties, they also achieved the poorest rankings compared with horses of other dominant personality components.

Although penalties give more realistic insight into the performance of an individual horse since it depends on the number of obstacles knocked down, refusal to jump, disobedience, and total speed, ranking also depends on total number of horses in each class and also way of jury the class, it is still a valuable tool for detecting differences between the groups.

Stress due to transportation and competition of horses also influenced the behaviour of the observed horses. In all questionnaires, it was noted that horses showed different behaviour patterns between normal training sessions and competition, especially if they were transported before the competition. This is particularly a problem among elite showjumpers used for international showjumping competitions that are transported on long distances regularly, often not even going home between competitions, with minimum recovery time (Hinchcliff et al., 2014). Such stress influences the health and welfare of the horse, including its reproductive traits. Since the majority of mares and stallions used

for showjumping have breeding potential, this is very important. The negative influence of stress on the gonads is well known and described. Due to increased glucocorticoid secretion, there is decreased LH secretion and blockage of the hypothalamus-pineal gland-gonad axis, which leads to the suppression of sexual behaviour and reflexes as described in rats (Kirby at al., 2009). Influence of stress on the reproductive functions of stallions and mares was researched and described by Aurich and Aurich (2008), who examined its impacts on reproductive function and fertility. They concluded that although in horses, as in rats, there could be a stress-influenced decrease of gonadotropin secretion with consequential negative impacts on fertility, semen quality in stallions was unchanged. In mares an increase of cortisol was observed and it was obvious that transportation led to this stress, though they did not find any direct negative influence on cyclicity or conception ability (Aurich and Aurich, 2008). On contrary, Campbell (2014) analysed data from sport mares used for embryo transfer and determined that the combination of transport and increased rectal temperature during training and strain from training decreased the chances of obtaining live embryos in these mares. The negative influence of training is associated with the preovulatory phase, since the negative influence on embryo recovery rate was present even when mares were spared of work between insemination and embryo collection.

According to our results, reproductive status and sex were both important factors that affected both penalties and rankings in showjumping competitions. Mares had the largest, statistically significant difference in penalties between the reproductive season (Summer Cup) and out of season (Winter Cup), which was less observed in geldings and stallions. Mares in heat displayed more aggressiveness in work, they are more demanding to ride and train and could show pain in back and hind legs (Jorgensen, 1996). Furthermore, mares are more difficult to separate from the herd and their familiar horses than geldings (Górecka-Bruzda et al., 2022). In combination, this could lead to decrease in performance, so there is a developing trend in equine industry to use oestrus blockage in sport mares (Riviera del Alamo et al., 2008; Samper, 2009; Kim et al., 2022). There are many methods based on hormonal, nonhormonal and immunological blockage of cyclicity (Nie et al., 2003; Elhay et al., 2006; Hedberg et al., 2006; Imboden et al., 2006; Card, 2009). These methods successfully prevent all oestrus-induced difficulties in sport mares, leading to better performance and results in showjumping and could also improve results in the mares examined here.

Stallions did not show any expected difference in performance by season. Since the majority of stallions in this study are also used for breeding, we expected that they would be more distracted during the reproductive season, though this was not confirmed.

This study also analysed the influence of age on results (penalties and rankings), keeping in mind the already explored distracting factors. It was determined that age and experience had the least effect on the results of showjumping competitions. According to Murrey (2014), elite showjumpers experience their peak performance (best rankings and least penalties) between the ages of 9 and 13 years. According to official FEI statistics, showjumping horses reach their peak at an average age of 11.5 years. This study showed different results, with the best performance (best rankings and least

penalties) observed in horses older than 13 years. However, this difference could be explained by the use of cycle blockers in most mares in Murray (2014), as opposed to no use in this study.

Accordingly, the broader introduction of cycle blockage methods in mares used for showjumping competitions could lead to better results in all sex and age categories of horses. It is essential to perform more thorough analysis of all parameters applied in this study on a larger sample of horses used in showjumping competitions in Croatia and abroad to determine its exact relevance on the population of showjumping horses worldwide.

Conclusions

The dominant personality component in showjumping horses had a strong influence on equine performance (in penalties and rankings). Horses with protection as the dominant personality component achieved the best results, while horses with excitability as the dominant personality component had the poorest results.

Determination of the dominant personality component before selection of horses for showjumping competitions could enable the selection of horses more suitable for achieving the best results. Mares achieved significantly better results at showjumping competitions when out of season than during the reproductive season. Therefore, the broad introduction of cycle blocking methods is recommended in all mares used for showjumping.

Geldings had the least differences in penalties and rankings by season, while stallions showed a small but insignificant difference. The best results were achieved by the oldest and the most experienced horses, over 13 years, despite expectations that horses in their prime, 9-13 years old would be best. The broader introduction of methods for cycle blockage in mares used for showjumping competitions could lead to better results in all sex and age categories of horses.

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Međusobni utjecaj reproduktivnog statusa, dobi i osobnosti konja na ostvarivanje punog atletskog potencijala u natjecanjima u preponskom jahanju

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Cilj je ovog istraživanja bio utvrditi postoji li veza između osobnosti, reproduktivnog statusa i dobi u ostvarivanju optimalnih rezultata u preponskom jahanju U istraživanju je analiziran 41 konj toplokrvnog tipa različitog reproduktivnog statusa, dobi i osobnosti i njihovi rezultati u natjecanjima u preponskom jahanju u 2 sezone. Ukupno je korišteno 8 pastuha, 18 kobila i 15 kastrata. Konji su podijeljeni u skupine prema dobi: mladi konji 4-7 godina (n=15) zreli konji stari 8-13 godina (n=13) i stariji konji u dobi 14-20 godina (n=13). Treća podjela bila je prema dominantnoj karakternoj komponenti određenoj prema upitnicima po Loydu: Ekscitabilni konji (n=4), zaštitnički nastrojeni konji (n=7), društveno nastrojeni konji (n=15) i dominantno znatiželjni konji (n=9), konji bez dominantne osobine (n=6). Istraživani konji su uspoređivani na temelju rezultatskih lista Hrvatskog konjičkog Saveza. Ukupno su bili dostupni rezultati s 80 utakmica, odnosno 44 turnira koja su održana tijekom Zimskog i Ljetnog kupa. Korišteni su podatci za 3280 startova. Zimski kup (01.10-01.03) odvijao se u vrijeme kad konji nisu spolno aktivni, dok su za vrijeme Ljetnog kupa (01.03-01.10) kobile bile u ciklusu i redovito su se tjerale. Na temelju statističke obrade podataka i njihove interpretacije razvidno je da osobnost konja utječe na njihovu uspješnost u smislu postignutog plasmana i broja kaznenih bodova. Konji ekscitabilnog karaktera postizali su najlošije rezultate što je osobito bilo izraženo za vrijeme sezone spolne aktivnosti kobila (P<0.05). Dominantno zaštitnički nastrojeni konji postigli su najbolje rezultate, bez obzira na spolnu sezonu. Vrlo je vjerojatno da bi određivanje dominantne karakterne komponente prije uvođenja konja u sport moglo pomoći odabiru konja prikladnih

za postizanje najboljih rezultata. Kastrati su prema postignutim kaznenim bodovima i ostvarenim rezultatima tijekom i izvan sezone najmanje varirali, dok su kobile imale značajno bolje rezultate izvan sezone spolne aktivnosti ($P<0.05$). Pastusi su također postizali bolje rezultate izvan sezone spolne aktivnosti, ali navedena razlika nije bila statistički značajna. Stoga bi kontrola ciklusa u smislu blokade ciklusa kobila, povoljno utjecala na postignute rezultate u svih promatranih dobnih i spolnih skupina konja. Suprotno očekivanjima konji srednje dobi (9-13 godina) postizali su slabije rezultate od konja starijih od 13 godina. Potrebno je dodatno istražiti sve promatrane parametre na znatno većem broju sportskih konja svih dobnih i spolnih kategorija kako bi se utvrdilo u kojoj mjeri naši zaključci mogu biti primjenjivi na kompletnu populaciju konja toplokrvnog tipa koji se koriste za natjecanja u preponskom jahanju u Republici Hrvatskoj, a i u drugim državama.

Ključne riječi: *toplokrvni konji, preskakanje prepona, osobnost konja, blokada ciklusa kobila*