

THE RESULTS OF REPRODUCTION UTILITY OF THE POLISH PRIMITIVE HORSE IN  
THE CHOSEN STUD FARM IN POLAND IN THE PERIOD  
WYNIKI UŻYTKOWANIA ROZPŁODOWEGO KONIKA POLSKIEGO Z WYBRANEJ Z  
STADNINY KONI W POLSCE

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**ABSTRACT**

The analysis of Polish Primitive Horse reproduction, in the stable breeding in Dobrzyniewo, was carried out in the period 1993/1994 – 2003/2004. On the basis of the carried out analysis it is evident systematic increase (positive trend) of basic coefficients of reproduction (foaling, fertility, fecundity, birth) and a decrease of coefficients of infertility and abortions. On the other hand leading sires were stallions: Mikrus and Jehol, which were utilised in reproduction for the period of 11 years while mares covered by these stallions had relatively high coefficients of reproduction.

KEY WORDS: Polish Primitive Horse, coefficients of reproduction, tendencies

**STRESZCZENIE**

Analizę rozrodu konika polskiego z hodowli stajennej w Dobrzyniewie przeprowadzono za okres 1993/1994 – 2003/2004. Z przeprowadzonej analizy wynika systematyczny wzrost (trend dodatni) podstawowych wskaźników rozrodu (źrebności, płodności, plenności i wyżrebień), a spadek wskaźnika jałowienia i poronień. Z kolei czołowymi reproduktorami okazały się ogiery: Mikrus i Jehol, które były użytkowane rozplodowo przez okres 11 lat, natomiast klacze kryte tymi ogierami charakteryzowały się stosunkowo wysokimi wskaźnikami rozrodu.

SŁOWA KLUCZOWE: konik polski, wskaźniki rozrodu, tendencje.

**DETAILED ABSTRACT**

Badaniami objęto 60 klaczy, 8 ogierów rasy konik polski użytkowanych rozplodowo w stadninie Koni Dobrzyniewo w latach 1993/1994-2003/2004. Obliczono podstawowe wskaźniki rozrodu tj. wskaźnik żrebności, jałowienia, poronień, płodności, plenności (produkcyjności), odchowu i wyźrebień. Ponadto dokonano charakterystyki oceny użyteczności rozplodowej 8 ogierów na podstawie wyliczonych wskaźników rozrodu klaczy.

W badanym okresie zaobserwowano wyraźny postęp hodowli konika polskiego w SK Dobrzyniewo o czym świadczy systematyczny wzrost (trend dodatni) podstawowych wskaźników rozrodu (żrebności, płodności, plenności i wyźrebień), a spadek wskaźnika jałowienia i poronień. Czołowymi reproduktorami okazały się ogierzy: Mikrus i Jehol, które były użytkowane przez okres 11 lat, a klacze kryte tymi ogierami charakteryzowały się stosunkowo wysokimi wskaźnikami rozrodu

**INTRODUCTION**

Polish Primitive Horses and Hucul Horses are counted to the Primitive breeds. Breeding of these races is carried on both in the studs [5] and reservation breeding [4,8,7].

The breeding of these races of horses is aiming at the preservation of genetic bio-diversity counteracting, at the same time, the increase of inbreeding coefficient which might come out because of the small number of population.

It is visible particularly in the reservation breeding [3]. The purpose of stud breeding is also the preservation of the utility traits and at the same time carrying out the utility trials of these horse breeds [2].

The aim of work was the analysis of reproduction utility of Polish Primitive Horse from the stable breeding utilized in the Horse Stud Farm Dobrzyniewo in years 1993/1994-2003/2004.

**MATERIAL AND METHODS**

The research comprised 60 mares, 8 stallions of the Polish Primitive Horse utilized reproductively in the Horse Stud Farm Dobrzyniewo in years 1993/1994 – 2003/2004. The numerical data, concerning the reproduction traits, were taken from the files of Stud Farm Dobrzyniewo. The presented coefficients of reproduction of mares were calculated according to the following formulae:

1. the coefficient of pregnancy = the number of pregnant mares / the number of covered mares x 100%
2. the coefficient of sterility = the number of sterility mares / the number of covered mares x 100%
3. the coefficient of abortion = the number of

abortion mares / the number of pregnant mares x 100%

4. the coefficient of fertility = the number of foals born alive / the number of covered mares x 100%

5. the coefficient of fecundity = the number of weaned foals / the number of covered mares x 100%

6. the coefficient of rearing = the number of reared foals / the number of foals born alive x 100%

7. the coefficient of foaling = the number of born foals / the number of mares in the herd x 100%

The presented values of coefficients, describing the reproduction of mares were shown as a function of the first degree that is the straight trend line [9,11]. For the particular trend line the correlation coefficient was calculated  $r_{xy}$  [10]

assuming:

x- the following years as an operand (an independent variable)

y- the trend line as a dependent variable

Moreover the characterization of reproduction utility of 8 stallions has been carried out on the basis of the calculated reproduction coefficients of mares utilized in the period 1993/1994 – 2003/2004.

**RESULTS AND DISCUSSIONS**

The results concerning the tendencies of the calculated coefficients, describing the reproduction utility of Polish Primitive Horse mares, were presented in the table 1. In the investigated period of time an increase (positive trend) of foaling, fertility, fecundity and births coefficients was visible.

Because of this the tendency line equation for the coefficient of foaling of mares utilized reproductively in these years had a value  $y' = 81,02 + 1,39x$  and it proves constant increase of the coefficient on the average 1,39 individuals per year. A relative increase per year was 1,72%. The highest relative increase appeared in the coefficient of births of mares (3,68%) for which unanimously the mean increase per year was 2,37 individuals and the coefficient was statistically very significant ( $r_{xy} = 0,67^{**}$ ). A positive phenomenon was noticed also in the decreasing tendency of infertility and miscarriage coefficients. The coefficient of infertility didn't appear at the end of the investigated period, and the coefficient of miscarriage, which at the beginning of the 90-ies was on the level of 13% in 2003/2004 was around 4-5% and it was higher than breeding of this race in other centers [1] and it was on the similar level in the stable breeding of Hucul breed utilized in the Horse Stud Farm Gładyszów in years 1993-2003 [6]. Only

Tabela 1. Linia tendencji (trend) dotycząca wskaźników rozrodu klaczy konika polskiego w Stadninie Koni Dobrzyniewo w latach 1993/1994 - 2003/2004

Table 1. The tendency line (trend) concerning the coefficients of reproduction of mares of the Polish Primitive Horse Stud Farm Dobrzyniewo in years 1993/1994 - 2003/2004.

Wskaźnik Rate of	Lata 1993/1994 - 2003/2004 Years 1993/1994 - 2003/2004		trend tendency n = 11	R <sup>2</sup>	r <sub>xy</sub>	Względny wzrost lub spadek The relative increase or decrease (%)
	1993/1994	2003/2004				
źrebnosci pregnancy	88,5	96,0	$y' = 81,02 + 1,39x$	0,338	0,58	1,72
jałowienia <sup>1</sup> sterility	11,5	-	$y' = 19,57 - 1,54x$	0,220	- 0,47	8,05
poronienia abortion	13,0	4,2	-	-	-	-
plodności fertility	78,3	87,5	$y' = 83,06 + 0,98x$	0,111	0,33	1,18
plenności fecundity	69,2	80,0	$y' = 67,28 + 1,83x$	0,326	0,57	2,72
odchowu rearing	100,0	95,2	$y' = 101,32 - 0,45x$	0,399	-0,63**	0,44
wyżrzebień foaling	69,2	84,0	$y' = 64,45 + 2,37x$	0,449	0,67**	3,68

<sup>1</sup>Trend obliczony za lata 1993/1994-1999/2000 The tendency line of 1993/1994-1999/2000 years

Tabela 2. Charakterystyka użytkowości rozplodowej ogierów na podstawie wskaźników rozrodu klaczy w Stadnie Koni Dobrzyniewo w latach 1993/1994 – 2003/2004  
 Table 2. The characterization of reproduction utility of stallions on the basis of reproduction coefficients of mares in the Horse Stud Farm Dobrzyniewo in years 1993/1994 – 2003/2004.

Nazwa ogiera The name of a stallion	Liczba lat użytkowania ogiera The number of stallion	Liczba pokrytych klaczy The number of covered mares		Wskaźniki rozrodu klaczy The mares birth rate					LUŻ* ♀/♂
		źrebności pregnancy	jałowienia sterility	poronień abortion	plodności fertility	plenności fecundity	odchowu rearing		
Trębacz	2	14	64,3	35,7	100,0	64,3	100,0	1,25	
Mikrus	11	72	82,9	15,8	87,6	70,5	100,0	1,08	
Jehol	11	74	89,0	11,0	87,6	76,7	98,5	0,78	
Narcyz	1	6	100,0	0	100,0	100,0	100,0	0,50	
Jaszczyk	3	19	89,7	10,3	88,9	78,6	100,0	0,67	
Nobis	4	32	100,0	0	97,5	94,4	96,9	1,00	
Komes	2	8	87,5	12,5	100,0	75,0	87,5	0,50	
Noktus	1	6	100,0	0	100,0	100,0	100,0	1,00	

\* LUŻ - stosunek liczby urodzonych źrebiąt (klaczy/ogierów) - the ratio of born foals (mares/stallions)

the coefficient of rearing was decreased (95,2%) which for a few years was on the level of maximum (100%). However it is comparable to the Hucul breed of horses [6]. On the other hand the coefficient of fecundity, that is the ratio of weaned foals to the number of covered mares, as an indicator of the breeding success showed increasing tendency from year to year ( $y' = 67,28 + 1,83 x$ ). The coefficient is significant because it is the outcome between genetic and phenotype values of foals, the traits which were given by the parents and on the other hand the environmental conditions created by the breeder (buildings, fodder, supervision etc.). Other factors have an impact on the decrease of the number of weaned foals (fecundity). In the reservation there are often drownings, dwarfism, inborn traits [3]. On the other hand in the stable breeding there are deaths and putting to sleep because of the fate accidents. Quoting Balińska and Nowicka-Posłuszna [1] the coefficient of fertility for the Polish Primitive Horse in Kobylniki and Sieraków Stud Farm mean for the years 1984/1985 – 2002/2003 was respectively 72,7%; 79,3%. Table 2 presents the analysis of reproduction of 8 stallions on the basis of the reproduction of mares. The leading stallions, which were utilized reproductively for the longest period of time (11 years) were Mikrus and Jehol. Mares covered by these stallions in the number of 72, 74 were characterized by the relatively high coefficients of reproduction. We can say that the coefficients of reproduction of mares, which were obtained as a result of covering by Mikrus and Jehol, were similar to the coefficients obtained for the mares of Hucul breed which were covered by outstanding sires of this breed (eg. Jaśmin, Prislöp IX – 81, or Piaf) [6]. The ratio of gender (♀/♂) of progeny ranged from 0,5 to 1,25.

## CONCLUSIONS

1. During the investigated period (1993/1994 – 2003/2004) a significant progress was visible for breeding of Polish Primitive Horse in the Horse Stud Farm Dobrzyniewo. The progress is visible by the systematic increase of basic coefficients of reproduction that is foaling, fertility, fecundity, births coefficients and the decline of coefficients of infertility and miscarriage.
2. The leading sires were stallions: Mikrus and Jehol, which were utilized for 11 years. Mares covered by these sires had high coefficients of reproduction.

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