A PRELIMINARY ANALYSIS OF CONSERVATION PROGRAMME EFECTS FOR COLD BLOODED HORSES IN POLAND

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The cold blooded horses were bred in Poland from the middle of XIX century. The local varieties (Sokolski, Sztumski, Lidzbarski, Garwolinski, Lowicki, Kopczyk Podlaski) were created on the basis of autochthonous mares crossed with stallions imported from France (Breton, Ardennes), Belgium and Germany. After the II World War the changes in the agricultural economy resulted in substantial decrease of population of cold blooded horses and their utilization in agriculture.
An introduction of one stud book and breeding program for all cold blooded horses in 1960 resulted in combining of existing local breeds and types. Until early 2000 only Sokolski (lighter type) and Sztumski (heavier type) horses have survived.

Kopczyk Podlaski

Lidzbarski

Lowicki

Sokolski

Sztumski

The expansion of horse animal genetic conservation programs after 2005 has created an opportunity for restitution of two remaining native cold blooded horse breeds: Sokolski horse originate in East and North-east of Poland (Podlasie region) and Sztumski horse originate in the north of Poland (Pomerania region). Currently, the population of cold blooded horses under conservation consists of 584 Sokolski and 466 Sztumski mares. The general criteria for participation in the conservation programme include a typical morphological conformation and desired, well defined pedigree.
The aim of this study was to characterize these two native horse populations, on the basis of:

- their distribution in Poland;
- trends in mares' body conformation between 1962 and 2010;
- analysis of genetic markers.

The results of research carried out last three years showed the positives effects of selection within the respective conserved populations – the increase of body size difference between breeds.

Fig. 1. The number of Sokolski and Sztumski mares participating in the conservation programme in the regions of Poland

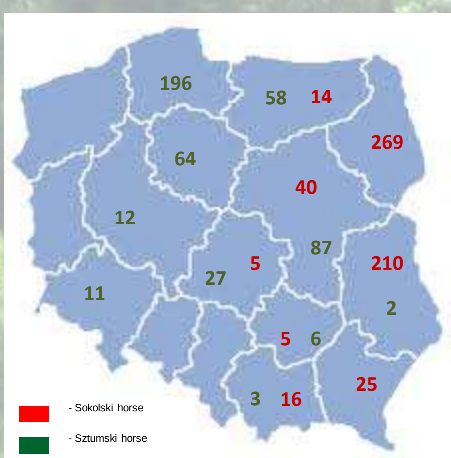


Fig. 2. Mean withers height in Sokolski (sok) and Sztumski (sz) mares in 1962 and 2010

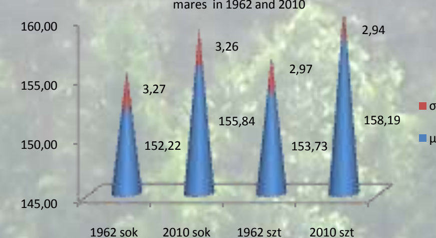
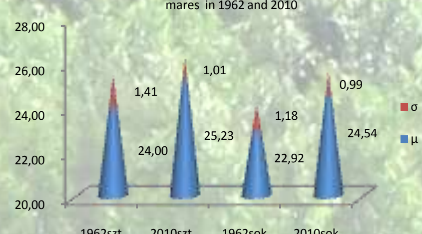


Fig. 3. Mean bone circumference in Sokolski (sok) and Sztumski (sz) mares in 1962 and 2010



Fot. G. Polak

Genetic material currently available only for 230 mares of Sztumski horse ,was collected. 5 blood group loci (A, C, D, K, Q); blood protein loci (AL, GC, ES, A1b, TF) and 12 microsatellites (VHL20, HTG4, AHT4, HMS7, HTG6, HTG7, HMS3, HMS2, HTG10, AHT5, HMS6, ASB2) were examined. The analysis were carried out in Poznan Agricultural University, Equine Blood Typing Laboratory by the team of Dr Cholewinski. The results are presented in the table 1. below.

Tab. 1. Sztumski horse genetic markers

Blood Protein

Locus	Marker	N	Frequencies
AL	*	12	0,0261
	A	154	0,3348
	B	294	0,6391
	∑	**460**	**1,0000**
GC	*	12	0,0261
	F	409	0,8891
	S	39	0,0848
	∑	**460**	**1,0000**
ES	*	12	0,0261
	0	8	0,0174
	F	136	0,2957
	I	303	0,6587
	S	1	0,0022
	∑	**460**	**1,0000**
A1B	*	13	0,0283
	F	6	0,0130
	K	432	0,9391
	S	9	0,0196
	∑	**460**	**1,0000**
TF	*	12	0,0261
	D	40	0,0870
	F1	6	0,0130
	F2	114	0,2478
	F3	18	0,0391
	H1	16	0,0348
	H2	88	0,1913
	O	47	0,1022
	R	119	0,2587
	∑	**460**	**1,0000**

Blood Group

Locus	Marker	N	Frequencies
D	#	35	0,0761
	*	12	0,0261
	adl	19	0,0413
	adlr	64	0,1391
	bcm	37	0,0804
	bcmq	1	0,0022
	cegimn	9	0,0196
	cgm	69	0,1500
	cgmr	3	0,0065
	d	1	0,0022
	del	23	0,0500
	delo	27	0,0587
	dghm	58	0,1261
	dghmr	53	0,1152
	dkl	41	0,0891
	dln	5	0,0109
	q	3	0,0065
	∑	**460**	**1,0000**

* - not examined
\# - not specified

Microsatellites

Locus	Marker	N	Frequencies
VHL20	#	15	0,0326
	*	1	0,0022
	I	69	0,1500
	J	2	0,0043
	L	7	0,0152
	M	34	0,0739
	N	39	0,0848
	O	98	0,2130
	P	110	0,2391
	Q	61	0,1326
	R	23	0,0500
	S	1	0,0022
	∑	**460**	**1,0000**
HTG4	#	5	0,0109
	K	8	0,0174
	L	135	0,2935
	M	182	0,3957
	N	3	0,0065
	O	83	0,1804
	P	43	0,0935
	Q	1	0,0022
	∑	**460**	**1,0000**

Locus	Marker	N	Frequencies
AHT4	#	7	0,0152
	*	1	0,0022
	H	60	0,1304
	I	54	0,1174
	J	124	0,2696
	K	28	0,0609
	L	5	0,0109
	M	1	0,0022
	N	11	0,0239
	O	149	0,3239
	P	20	0,0435
	∑	**460**	**1,0000**
HMS7	#	45	0,0978
	J	9	0,0196
	K	6	0,0130
	L	121	0,2630
	M	108	0,2348
	N	146	0,3174
	O	22	0,0478
	P	3	0,0065
	∑	**460**	**1,0000**

Locus	Marker	N	Frequencies
HTG6	#	9	0,0196
	*	15	0,0326
	G	61	0,1326
	I	11	0,0239
	J	14	0,0304
	K	3	0,0065
	N	5	0,0109
	O	341	0,7413
	P	1	0,0022
	∑	**460**	**1,0000**
HTG7	#	7	0,0152
	*	28	0,0609
	K	58	0,1261
	L	4	0,0087
	M	134	0,2913
	N	123	0,2674
	O	103	0,2239
	P	3	0,0065
	∑	**460**	**1,0000**

Locus	Marker	N	Frequencies
HMS3	#	15	0,0326
	*	2	0,0043
	G	2	0,0043
	I	6	0,0130
	L	2	0,0043
	M	34	0,0739
	N	26	0,0565
	O	15	0,0326
	P	228	0,4957
	Q	74	0,1609
	R	56	0,1217
	∑	**460**	**1,0000**
HMS2	#	13	0,0283
	*	18	0,0391
	H	194	0,4217
	I	28	0,0609
	J	7	0,0152
	K	93	0,2022
	L	42	0,0913
	M	1	0,0022
	O	1	0,0022
	P	1	0,0022
	R	62	0,1348
	∑	**460**	**1,0000**

Locus	Marker	N	Frequencies
HTG10	#	21	0,0457
	*	8	0,0174
	I	28	0,0609
	K	12	0,0261
	L	28	0,0609
	M	105	0,2283
	N	91	0,1978
	O	84	0,1826
	P	6	0,0130
	Q	3	0,0065
	R	58	0,1261
	S	16	0,0348
	∑	**460**	**1,0000**
AHT5	#	119	0,2587
	*	36	0,0783
	I	4	0,0087
	J	111	0,2413
	K	55	0,1196
	L	19	0,0413
	M	38	0,0826
	N	53	0,1152
	O	25	0,0543
	∑	**460**	**1,0000**

Locus	Marker	N	Frequencies
HMS61	#	3	0,0065
	*	40	0,0870
	K	20	0,0435
	L	132	0,2870
	M	56	0,1217
	N	6	0,0130
	O	30	0,0652
	P	172	0,3739
	Q	1	0,0022
	∑	**460**	**1,0000**
ASB2	#	27	0,0587
	*	5	0,0109
	I	57	0,1239
	J	1	0,0022
	K	12	0,0261
	M	83	0,1804
	N	154	0,3348
	O	28	0,0609
	P	10	0,0217
	Q	80	0,1739
	R	3	0,0065
	∑	**460**	**1,0000**