

## REPRODUCTIVE PERFORMANCE OF POMERANIAN SHEEP IN THE BALDRAM CONSERVATION HERD

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### ABSTRACT

This research presents the evaluation of the reproductive performance of Pomeranian sheep, bred in the Baldram conservation herd (Elbląg province) over two consecutive years. The number of evaluated ewes in the selected farm was: 66 mated (including 61 lambing) in 2004 and 74 mated (including 74 lambing) in 2005. Fertility in 2004 was recorded at 92.4%, while the same in 2005 was 100.0%, prolificacy values were respectively: 155.7% and 139.2%, lamb rearing: 98.9% and 87.4%, and reproductive performance: 142.4% and 121.6%. The comparison of different time periods revealed a decline in the values of the reproductive parameters. Out of 198 lambs born in both years, 46.5% constituted ram lambs and 53.5% ewe lambs. Among the birth types, litters with single lamb were dominant (54.1%), while litters with twins constituted only 45.2%. Over the two years analysed, there was only 1 litter with triplets. On the basis of the results gathered, it can be concluded that the mean values of the reproductive indices, for both years of Pomeranian sheep breeding in the Baldram herd, do not deviate from the accepted breed model and from the results registered by the Polish Sheep Breeding Association.

**KEY WORDS:** Pomeranian sheep, conservation breeding, reproductive performance

### STRESZCZENIE

W badaniach przedstawiano ocenę użytkowości rozplodowej owiec rasy pomorskiej objętej hodowlą zachowawczą w dwóch kolejnych latach użytkowania, pochodzących ze stada Baldram (województwo elbląskie). Liczba ocenianych maciorek w wybranym stadzie wynosiła: w 2004 roku 66 szt. pokrytych (w tym 61 wykończonych) i w 2005 roku 74 szt. pokrytych (w tym 74 szt. wykończonych). Płodność w 2004 roku kształtowała się na poziomie 92.4%, podczas gdy w 2005 roku wynosiła 100.0%, plenność odpowiednio: 155.7% i 139.2%, odchów jagniąt: 98.9% i 87.4% oraz użytkowość rozplodowa: 142.4% i 121.6%. Porównując okresy badawcze, zaobserwowano spadek wartości wskaźników rozrodu. Spośród urodzonych w obu latach 198. jagniąt, 46.5% stanowiły tryczki a 53.5% maciorki. Wśród typów miotów dominowały pojedyncze (54.1%), bliźniacze stanowiły 45.2%. W okresie dwóch analizowanych lat odnotowano tylko 1 miot trojaczy. Na podstawie zgromadzonych wyników można stwierdzić, iż średnie wskaźniki rozrodu dla obu lat użytkowania owcy pomorskiej w stadzie Baldram nie odbiegają od wzorca rasowego i wyników zarejestrowanych przez Polski Związek Owczarski.

**SŁOWA KLUCZOWE:** owca pomorska, hodowla zachowawcza, użytkowość rozplodowa

## STRESZCZENIE SZCZEGÓŁOWE

Rodzime owce rasy pomorskiej należą do grupy owiec długowłnistych i objęte są programem ochrony zasobów genetycznych. Celem pracy było przedstawienie wskaźników użytkowości rozplodowej w stadzie zachowawczym we wsi Baldram, w województwie elbląskim.

Stado zowczarni Baldram od początku istnienia jest stadem zarodowym, a dodatkowo od 2004 roku zostało objęte programem ochrony zasobów genetycznych. Równolegle jest tu prowadzona działalność agroturystyczna, stąd hodowla owiec nabiera w gospodarstwie szczególnego znaczenia. W wybranym stadzie zwierzęta utrzymywane są systemem alkierzowo-pastwiskowym.

W badaniach przedstawiano charakterystykę użytkowości rozplodowej maciorek owcy pomorskiej w dwóch kolejnych latach użytkowania (2004 i 2005 rok). Dodatkowo oceniono poddańczość masę ciała jagniąt w wieku 56 dni i losy jagniąt po odsadzeniu, tj. w wieku 100 dni. Liczba ocenianych maciorek w wybranym stadzie wynosiła: w 2004 roku 66 szt. pokrytych (w tym 61 wykończonych) i w 2005 roku 74 szt. pokrytych (w tym 74 szt. wykończonych). Płodność w 2004 roku kształtowała się na poziomie 92.4%, podczas gdy w 2005 roku wynosiła 100.0%, plenność odpowiednio: 155.7% i 139.2%, odchow jagniąt: 98.9% i 87.4% oraz użytkowość rozplodowa: 142.4% i 121.6%. Porównując lata użytkowania, zaobserwowano spadek wartości analizowanych wskaźników rozrodu. Spośród urodzonych w obu latach 198. jagniąt 46.5% stanowiły tryczki, a 53.5% maciorki. Wśród typów miotów dominowały pojedyncze (54.1%), bliźniacze stanowiły 45.2%. W okresie dwóch analizowanych lat odnotowano tylko 1 miot trójaczy.

Przedstawione wyniki użytkowości rozplodowej w wybranym stadzie owcy pomorskiej nie odbiegły od średnich odnotowanych przez Polski Związek Owczarski dla tej rasy w 2004 i 2005 roku. Natomiast w porównaniu do danych cytowanych we wzorcu rasy („Program ochrony zasobów genetycznych owiec rasy pomorskiej”) wskaźniki płodności i użytkowości rozplodowej okazały się wyższe w 2004 roku, natomiast w 2005 roku były nieznacznie niższe. Powyższe badania należy traktować jako pilotażowe, które pozwolą w przyszłości na obiektywniejszą ocenę stada.

## INTRODUCTION

The Pomeranian sheep is the oldest breed in Poland amongst the long-wool sheep group. Currently these animals represent a wool-and-meat production and their

population in Poland is variable. Numbers of Pomeranian sheep ewes, as listed in the reproduction registers, were 5012 in 2004 and 4390 in 2005 [1, 2]. Their resistance to disease, relative ease of adaptation to adverse environmental conditions, together with low nutritional requirements is some of the characteristic traits of this breed. These qualities make breeding Pomeranian sheep possible in a cooler coastal climate, with low budget infrastructure (i.e. open sheds, shelters), which also make the coastal region visually more attractive. Additionally, this kind of animal keeping system promotes organic food production [3]. Native Pomeranian sheep belong to the long-wool group, which is covered by the Genetic Resource Protection Programme. The aim of the programme is not only protection from extinction, but also monitoring of the breed's productivity, as well as ongoing confrontation with the accepted breed's model. The aim of this work was the evaluation of the reproductive performance in the given conservation herd, in the village of Baldram, Elblag province.

## MATERIAL AND METHODS

The Baldram herd has been a nucleus flock since the beginning of its existence (1978), and it has been included in the Genetic Resource Protection Programme since 2004. The number of evaluated Pomeranian sheep ewes in the selected farm was: 66 mated (including 61 lambing) in 2004 and 74 mated (including 74 lambing) in 2005. The near 30% fall in the herd size was caused by the introduction of agritourism in 2005, which required the development of suitable tourist accommodation, thus committing less time to sheep husbandry.

Pomeranian sheep in the subject herd were kept in the alcove-pasture system. Winter nutrition was based on hay, and beet pulp with barley added, while summer nutrition - on pasture. In order to supplement mineral elements a salt lick was provided. Topping is normally performed in the autumn (September – October), while lambing occurs in the spring (February – April).

The source data came from breeding documentation of the Regional Sheep and Goat Breeders Association in Malbork (RZHOiK), as well as materials supplied by the herd owners. Among the reproduction traits the following were considered: number of lambs born and weaned type of birth and calculated values of the reproductive performance indices (in percentage):

- fertility – the number of lambing to the number ewes designer for reproduction,
- prolificacy – the number of born lambs to the number lambing,
- lamb rearing – the number of reared lambs to

the number of born lambs,

- reproductive performance – the number of weaned lambs to the number of ewes designed for reproduction.

Additionally, the values of body mass of 52-day-old lambs, as well as allocation of weaned lambs (export, replacement, breeding) were presented in this work. Traits were grouped according to the mother's performance year (2004 and 2005).

**RESULTS AND DISCUSSION**

Approximately 90% of Pomeranian sheep ewes covered by the performance evaluation live in the area of the Regional Sheep and Goat Breeders Association, based in Malbork. The herd in the village of BalDRAM is also under its control.

Fertility in 2004 was 92.4%, while in 2005 accounted for 100.0%, prolificacy, respectively, for 155.7% and 139.2%, lamb rearing – for 98.9% and 87.4%, while reproductive performance accounted for 142.4% and 121.6% (Fig.1). After comparisons of Pomeranian sheep performance in the BalDRAM farm over the years, a decrease in values of the analysed reproductive indices was noted.

The population model presented in the Genetic Resource Protection Programme for Pomeranian sheep [6], along with the values reported by Lipecka and Gruszecki [3], define prolificacy and reproductive performance only,

which for that breed is respectively: 140% and 115%.

Indices of prolificacy and reproductive performance of evaluated sheep in 2004 and 2005 seemed to be higher than the model [6] and the results noted by Niznikowski et al. [4]. Lower reproductive indices, recorded in the herd in 2005, could be a consequence of the fact that the values of those were very high in 2004, or they could be a result of low fertility of mothers in 2005. A similar conclusion was drawn by Pakulski [5], when analysing reproduction of coloured Merino ewes' reproduction. The introduction of agritourism in 2005 on the subject farm reduced the time the farm owners had available, especially during tugging and lambing, which had a significant effect on all performance indices in the second year of observation.

As shown in Table 1, there were 198 lambs born in that period and their gender split over the next two years was at a similar level - there were approximately 46.5% ram lambs and 53.5% ewe lambs born (Table 1). Comparison of performance over the two year period showed the lamb body mass values were at a similar level at the age of 56 days for both ewe and ram lambs. Mean body mass for ewes was 17.66 kg and for rams 20.02 kg, which appeared to be slightly lower in comparison to that quoted by the Polish Sheep Breeding Association [1, 2].

Among mothers in their first lambing season there were a majority of single lamb births (60.8%), while in the following year the types of birth were more even, such as twin births 52.5% and single births 45.9%. Over the

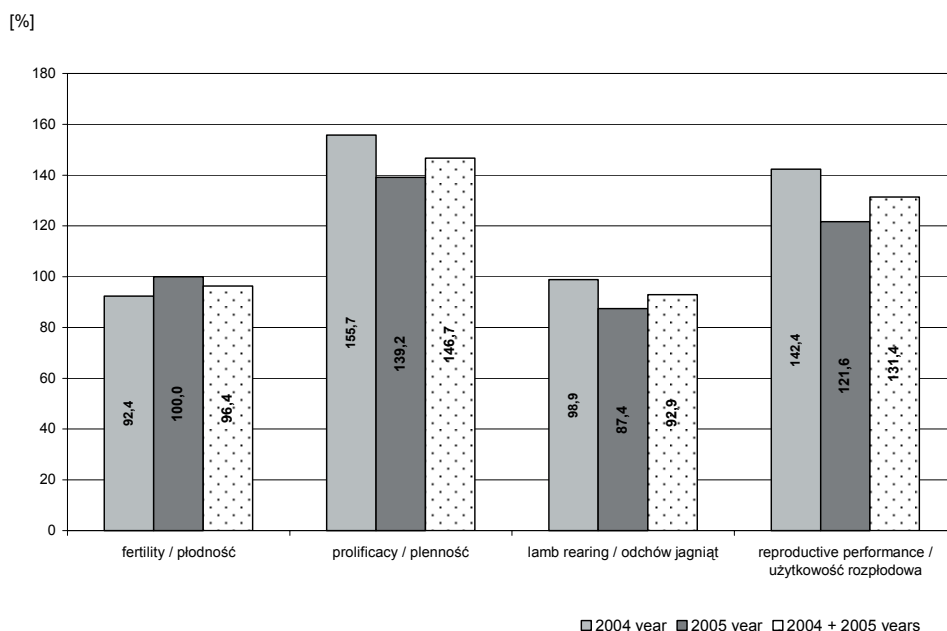


Fig. 1. Mean reproductive parameters in ewes of Pomeranian sheep breed over 2004-2005

Ryc. 1. Średnie wskaźniki użytkowości rozplodowej macierek owcy pomorskiej w latach 2004-2005

Table 1. Born and reared lambs, mean body weight of 56-day old lambs and litter size in the analyzed Pomeranian sheep flock

Tabela 1. Urodzone i odchowane jagnięta, średnia masa ciała w wieku 56 dni oraz wielkość miotu w analizowanym stadzie owcy pomorskiej

Wyszczególnienie Specification			Lata Years		Ogółem Total
			2004	2005	
jagnięta urodzone, born lambs,					
	ogółem/ total	szt./no	103	95	198
w tym/ including:	tryczki, ram lambs	szt./no	48	44	92
		%	46.6	46.3	46.5
	maciorki, ewe lambs	szt.	55	51	106
		%	53.4	53.7	53.5
jagnięta odchowane, reared lambs					
	ogółem/ total	szt./no	90	94	184
w tym/ including:	tryczki, ram lambs	szt./no	40	43	83
		%	83.3	97.7	90.2
	maciorki, ewe lambs	szt./no	50	51	101
		%	90.9	100.0	95.3
średnia masa ciała w wieku 56 dni/ mean body weight of 56-day-old lambs					
	tryczki, ram lambs	kg	19.97	20.10	20.02
	maciorki, ewe lambs	kg	17.45	17.85	17.66
typy urodzeń, birth types:					
	ogółem/ total	szt./no	74	61	135
w tym/ including:	pojedyncze, singles	szt./no	45	28	73
		%	60.8	45.9	54.1
	bliźniacze, twins	szt./no	29	32	61
		%	39.2	52.5	45.2
	trojacze, triplets	szt./no	0	1	1
		%	0.0	1.6	0.7

Table 2. Ram lambs and ewe lambs allocation over 2004-2005  
Tabela 2. Przeznaczenie tryczków i maciorek w latach 2004-2005

Przeznaczenie jagniąt Lamb allocation			Lata/ Years		Ogółem Total
			2004	2005	
Export, export					
	ogółem, total	%	79.8	44.4	62.5
	tryczki, ram lambs	%	40.4	40.4	39.7
	maciorki, ewe lambs	%	39.4	4.4	22.8
Remont, replacement					
	ogółem, total	%	13.8	51.1	32.1
	tryczki, ram lambs	%	-	-	-
	maciorki, ewe lambs	%	13.8	51.1	32.1
Hodowla, breeding					
	ogółem, total	%	6.4	4.44	5.4
	tryczki, ram lambs	%	6.4	4.44	5.4
	maciorki, ewe lambs	%	-	-	-

period of two years there was only a single case of triplets observed (Table 1).

The introduction of agritourism in 2005, as a new farming direction, affected the future allocation of the lambs after weaning. After 100 days of rearing in 2004 about 80% of lambs were allocated for export, 14% for replacement, and slightly over 6% for further breeding (Table 2). The following year the greatest percentage of reared lambs was allocated for replacement (51.1%), slightly less for export (44.4%), and about 4% were sold as breeding material. An interview conducted with the farm owners shows that with the existing farming direction, which involves reproductive and conservation breeding, launching agritourism services, on the one hand, can provide additional financial means for further sheep breeding and, on the other hand, it can create a demand for the farm's sheep products (meat, dairy products, wool and skins).

### CONCLUSIONS

- Mean values of reproductive indices for both years of Pomeranian sheep performance in the Baldram herd do not deviate either from the breed model nor from the results registered with the Polish Sheep Breeding Association.
- Reproductive parameters in 2005 were lower than in the previous year, which might have been the result of the owners being less interested in the herd during this time period.
- This research should be considered to be a pilot study, which may facilitate a more objective evaluation of the

herd in the future.

### REFERENCES

- [1] Hodowla owiec o kóz w Polsce w 2004 roku. Sheep and goat breeding in Poland in 2004. PZO, Warszawa, (2005).
- [2] Hodowla owiec o kóz w Polsce w 2005 roku. Sheep and goat breeding in Poland in 2005. PZO, Warszawa, (2006).
- [3] Lipecka Cz., Gruszecki T., Rasy zwierząt w Polsce – owce. Owca pomorska. Animal breeds in Poland – sheep. Pomeranian sheep. Med. Wet., (2006) 62, 10, 1209.
- [4] Niżnikowski R., Antczak A., Antczak M., Woźniakowska A., Ocena wskaźników plenności matek i odchowu jagniąt różnych ras utrzymywanych bez pomieszczeń na pastwisku w trakcie okresu wegetacyjnego. Evaluation of prolificacy indices of mothers and rearing of lambs of different breeds kept in open pasture over the vegetative period. Zesz. Nauk. Przegł. Hod. (2002) 63, 37-42.
- [5] Pakulski T., Kształtowanie się użytkowości rozplodowej maciorek w stadzie barwnego merynosa w zależności od wieku i typu urodzenia. Reproductive performance of coloured Merino ewes dependent on age and a birth type. Zesz. Nauk. Przegł. Hod. (2003), 68, 3, 53-60.
- [6] Program ochrony zasobów genetycznych owiec rasy pomorskiej. Genetic Resource Protection Programme for Pomeranian sheep. IZ, Kraków (2005).

