

It was proved, that certain genotypes of the PRNP gene are resistant to neurodegenerative disease in mice, sheep and man. Up to date such prove was not described in cattle. The association among different variants of PRNP gene and occurrence BSE are presented in the work of Goldman et al. (1994). They found two animals with BSE and all were with homozygous genotype 6/6. Neibergs et al. (1994) tested 56 animals with BSE disease and they identified 84 % with genotype PRNP 6/6 and 16 % with genotype of PRNP 5/6. They did not find any animal among infected animals with genotype of PRNP 5/5.

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OESTRUS INDUCTION AND SYNCHRONIZATION IN SHEEP DURING MILKING AND INCREASED OCCURRENCE OF EWES LAMBING TWINS

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Summary

The aim of this work was to verify the possibilities of inducing fertile oestrus in Slovak Merino ewes during spring lactation by means of a progesterone-based preparation of Slovakian origin. We strived to provide the breeders with an effective possibility of increasing ewe fertility and milk lamb production for the pre-Christmas market. Between May and November two flocks of Slovak merino ewes were observed. On May 2nd, fourteen rams were introduced for 8 weeks into Herd A comprising 350 un milked ewes (control animals). The experimental herd (herd B) comprised 150 milked ewes. These animals were treated with vaginal sponges containing 50 mg progesterone in microcrystalline water suspension (Agolutin-Depot, Biotika a.s.). After 12 days the sponges were withdrawn and the animals received 500 IU PMSG (SERGON inj. a.u.v., Bioveta Ivanovice na Hané, Czech Republic). On day 2 after tampon withdrawal 6 breeding rams were placed in the herd for 35 days. From the results achieved it follows unambiguously that the biotechnical method employed can help to intensify reproduction (20% occurrence of twin births) in sheep herds in the milking period. The finding is original in that using an ecologically clean progesterone-based preparation positively influenced reproduction during the lactation period.

Key words: lactation, ewes, oestrus induction, twin lamb.

Introduction

It is known from our previous results that biotechnical procedures of oestrus induction and synchronization in sheep during off-season physiological anoestrus can be effectively used to solve the problem of low herd fertility rates (MARAČEK, 1995, MARAČEK a kol., 1989, 1991,1995). Nowadays, when the purpose of sheep production is undergoing transformation, milk lambs are required not only by the pre-Easter but also by the pre-Christmas market (MARAČEK, BÍREŠ, 1999, MARAČEK, HENDRICHOVSKÝ, 1994, MARAČEK a kol., 1991, 1995).

Oestrus induction and synchronization is a biotechnical method usually employing pharmaceuticals to induce fertile oestrus in a herd of a given size off the mating season, during anoestrus (in the conditions of t his country usually in the spring) and at a pre-determined time (GAMČÍK, HARTWIGH, 1988, MARAČEK a kol., 1989, 1995).

It was the aim of this work to verify the possibility of inducing fertile oestrus in Slovak Merino ewes in the spring, during the milking period, using a progesterone-based preparation of Slovak provenience. We seeked to provide the breeders with an effective possibility of increasing sheep fertility and producing milk lambs for the pre-Christmas market.

Materials and methods

The observations were carried out in May in two herds of a Slovak Merino ewe breeder. Into Herd A counting 350 un milked animals (control herd) fourteen rams were placed for 8 weeks on May 2nd. Herd B (experimental one) counted 150 ewes milked for the production of lump sheep cheese. These animals were treated with vaginal sponges injected with 50 mg progesterone in microcrystalline water suspension (Agolutin-Depot, Biotika a.s., Slovenská Ľupča, Slovakia). On May 5th, the tampons were inserted for 12 days by a special applicator. After tampon withdrawal on May 17th each animal of Herd B was given 500 IU PMSG i.m. (SERGON inj. a.u.v., Bioveta, Ivanovice na Hané, Czech Republic). On the second day after tampon withdrawal 6 breeding rams were placed into Herd B for 5 weeks. At the time of tampon withdrawal 9 and 2 ewes were stated to have lost the sponges and to have aborted, respectively.

On November 20th, the results of reproduction were determined on the basis of the breeder's records. For statistical evaluation the chi-square test (χ^2) was used (ČERVENKA, 1975).

Results and discussion

The results of oestrus occurrence, mating, lambing and fertility rates are summarized in Table 1. From the latter it is evident that in the control herd of un milked and untreated sheep (Herd A, n=350) reared in a chalet without adjustment of the light regime 125 animals (i.e., about 35.7% of the herd) came into heat and were mated after 14 rams had been placed in the herd. In Herd B, in which the animals were treated with progesterone-containing vaginal sponges in combination with extrapituitary gonadotropin PMSG, 128 ewes came into heat and were mated, presenting 85.3% of the treated animals. The difference observed between Herds A and B was significant at $\chi^2 = 51.47$ and $P < 0.001$ with $P = 0.001$ at $\chi^2 = 10.83$. When comparing Herds B and A, fertility was statistically significantly improved in the former at a similar level ($P < 0.001$ at $\chi^2 = 99.25$). The markedly increased occurrence of multiple pregnancies, mainly twins (20%) after the induction of oestrus in lactating deserves a highly positive rating. In Herd B, twin occurrence reached almost 23% whereas in Herd A it was only 5.8%. It is the level of multiple pregnancies that is the determining criterion of the natality rate expressed as the number of lambs born per 100 ewes. In our case natality rates reached 126.4 after the induction of oestrus in lactating ewes (Herd B) and 105.8 in the untreated un milked controls (Herd A). Lambings took place between October 13th and November 14th, with 87.3% of ewes lambing until October 29th.

Table 1 Selected reproduction indices in two Slovak Merino herds

Index	HERD			
	A- control		B - experiment	
	A	%	A	%
Sheep observed	350	100,0	150	100,0
Sheep treated	-	-	150	100,0
Sponges lost	-	-	9	6,0
Sheep mated	125	37,5	128	85,3
Occurrence of abortions	6	4,8	2	1,7
Lambing – fertility	104	29,7	110	73,3
Lambs born	110	-	139	-
Fertilization – fecundity	-	31,4	-	98,6
Lambs per 100 lambings – natality	-	105,8	-	126,4
Ewes with 1 lamb	98	94,2	85	77,3
Ewes with 2 lambs	6	5,8	22	20,0
Ewes with 3 lambs	-	-	1	0,9
Ewes with 4 lambs	-	-	2	1,8
Lambs dying until Day 14 after birth	11	10,0	14	10,1

Of the results presented it follows expressly that the biotechnical method used can contribute to the intensification of reproduction in our sheep herds (MARGETÍN, 1996, MARGETÍN a kol., 1996). The finding is original in that treatment using an ecologically clean progesterone-based preparation (and not a synthetic gestagen prohibited because of possible residue occurrence) oestrus induction is also possible in the period of milking and lactation after cessation of the puerperium if a proper feed base can be provided. It is also important that a verified biotechnical procedure was employed in animal selection, thus helping to objectivize culling: testing of functional abilities of the sexual organs enables to lay open irreversible

defects of the genitals. Our results also point at increased lambing rates which are expressed in an increased percentage of ewes giving birth to two or more lambs, i.e., in an increased number of multiple pregnancies (GOODMAN, 1998). On the basis of the results achieved this method can be recommended for use in sheep herds in order to decrease the numbers of non-pregnant empty animals, to increase the occurrence of multiple pregnancies and to select ewes with lasting functional disturbances of genitals, i.e., to objectivize the culling procedure.

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THE DEVELOPMENT OF HARE POPULATION (*LEPUS EUROPAEUS*) IN WEST SLOVAK LOWLAND

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Summary

According to the official Hunting statistics, the actual stock numbers of hares fluctuate about 182956 individuals (minimum 169700 in 1997 and maximum 194616 in 1998) in the Slovak Republic in the past 10 years. If the given data are correct, it can be stated that the population density is stable. However, the actual stock numbers of hares are 60,74 % of standardized stock numbers only. Rapid decline (48.7 % during past 10 years) is registered in the hare production (max 63836 in 1990, min 16639 in 1996). Counted from the official statistics, 1 female from the spring stock produced 0.7 young hares in the bag in 1990, but in the period 1997-99 0.3 ones only. Correlation coefficient between spring numbers and the bag is very low (0.0979). Hunting plans for all game species are prepared every year. The plan of hare bag was fulfilled in 1990 only (111%). During monitored period, real number of shot hares represent only 83% of planned amount (in 1996 the real production was only 37 % out of the plan).

According to the bag analysis from selected sites, the increment of hares (expressed in % of young hares in the bag) is 51.07 % (min. 40.77 in 1993, max. 68.76 in 1997), what confirms the theory of stable populations. Reproduction coefficient R (expressing number of young hares per 1 adult in the bag) was 1.13 on average (min 0.76 in 1993, max 2.20 in 1997). Reproduction factor r (expressing number of young hares per 1 female in the bag) was 2.51 on average (min 1.75 in 1998, max 5.7 in 1997). The year 1996 was characterized by extremely bad climate conditions (cold winter with long-term snow cover, cold and wet summer), what caused drastically decline not only of young hares, but adult as well. During hunting season we did not gain any samples and we did not count the parameters of population dynamics. The big reproduction potential is expressed in 1997, when all monitored parameters gained high values, next year after population failure.

Key words: hare, *Lepus europaeus*, Slovakia

Introduction

Stock numbers of the brown hare population (*Lepus europaeus*) and its recruitments are subject to various influences all the time. The most hares were caught in Slovakia during the years 1933-36 (on average 243 726 animals annually), and then during the years 1973-74, i.e. in the conditions of intensive large-scale "socialistic" agriculture (on average 342 866 animals per year). We noticed deep decrease in stock numbers and in recruitment in 1975, however, in 1976-77 shot the hunters