

RESULTS CONCERNING THE FREEZING PRETABILITY OF BUCK SEMEN AND FECUNDITY AFTER ARTIFICIAL INSEMINATION OF LOCAL GOAT

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Abstract

The aim of this study was to evaluate the freezing pretability of semen collected from 38 bucks Alpine and Saanen breeds, imported from Germany (2005). For this reason semen was frozen in Tris and Natrium citrate extenders, besides seminal plasma, using the rapid freezing method in liquid nitrogen. The results of freezing pretability of semen were valuated by monitoring spermatoc and cryobiological index: the fresh semen motility versus freezing-thawing semen motility at 24 h after freezing, motility after Bloom staining of spermatozoa, ultrastructural damages studied by electron microscopy and finally, by direct testing of fecundant capacity of spermatozoa by artificial insemination of goat. The mean values of fresh semen motility were $86.81 \pm 0.88\%$ for Alpine and $85 \pm 2.24\%$ for Saanen, while after defreezing were $46.34 \pm 2.66\%$ for Alpine semen and $56.12 \pm 4.02\%$ for Saanen semen. Some ultrastructural damages were observed in freezing-thawing spermatozoa (partial and integral plasmatic membranae loss, nuclear and mitochondrial degeneration). The results were appreciated by „in vivo” testing of frozen semen, using artificial insemination of goats and monitoring the fecundity and prolificacy. So, we obtained a very good fecundity (60%) after artificial insemination of very good motility of the spermatozoa. All the results showed that buck semen has high pretability to freezing and can be used for artificial insemination. This study followed to find a possibility to preserve the good quality semen and to be distributed in time and space for the amelioration of the Romanian local goats.

Key words: frozen semen, pretability, motility, fecundity, prolificacy

INTRODUCTION

The advantages of frozen semen are well-known: zootechnically, economically and veterinary. Preservation of genes from goats and its dissemination in time and space, make easy the international genes exchanges. Artificial insemination with frozen semen contributes to improvement of local goats populations. All this presume the technologies improvement for semen freezing process. The frozen buck semen at high quality is used in artificial insemination of goats from farms in natural mate season and against season.

MATERIALS AND METHODS

The studies were made on 38 bucks from Alpine and Saanen breed imported from Germany, from which semen was collected

in view to freezing. The semen was collected with artificially vagina after bucks training for 7-10 days, in the presence of one goat with induced oestrus. After semen collecting it was made the first dilution 1:1 with Tris and natrium citrate medium, at pH 6,8-6,9.

The fresh semen valuation referred to: spermatoc volume directly readed in collection glass; spermatozoon concentration valuated with Spermaque photometer; valuation of semen motility on 1 to 100 scale in microscope. The ejaculates with more than 70% motility were washed in washing medium in view to remove the seminal plasma.

The semen dilutions were made in laboratory as follows: a dilution at 37°C until the semen concentration reached to 1×10^9 /ml; the last dilution at 4°C with

dilution medium containing the glycerol as cryoprotector. Then, the semen was frozen IN Tris and sodium citrate medium with a glycerinic level 8% and 10% yolk of egg, using the rapidly freezing method. The packing of semen prepared for freezing was done in plastique paillettes with 0,25 ml volume, in the freezing room. This method presume to place for 8 minutes the paillettes on a support at 4 cm distance from nitrogen level (nitrogen vapours) and then by immersing in the nitrogen liquid at -196°C.

The frozen-defrozed semen valuation was execute after 24 hours from freezing process by monitoring the general motility, individual motility ,the percent of alives or deaded spermatozoons (viability) by eosine-nigrosine colouring of semen smear.In our experiment were frozen 2800 paillettes.

To „in vivo” testing of frozen semen , the goats were prepared for artificial insemination .The oestrus was induced using Chronogest sponges with 45 mg fluorogestone acetate for 11 days, then it were administrated 125 µg prostaglandine PGF2α and Folligon 400 UI on day 8.Artificial inseminations were done at 43 hours after sponges removal, using a

vaginoscope and inseminationpistolet, in 1 or 2 intracervically insemination.

RESULTS

The results valuation was made by: monitoring of **cryobiological indicators** compairing with spermatic indicators (fresh semen motility versus frozen semen motility at 24 h after freezing process), motility after eosine-nigrosine colouring and finally, directly testing of fecundante capacity by artificial insemination of goat.The it was calculated the **reproduction indicators**: the fecundity and the prolificacy of inseminated goat.

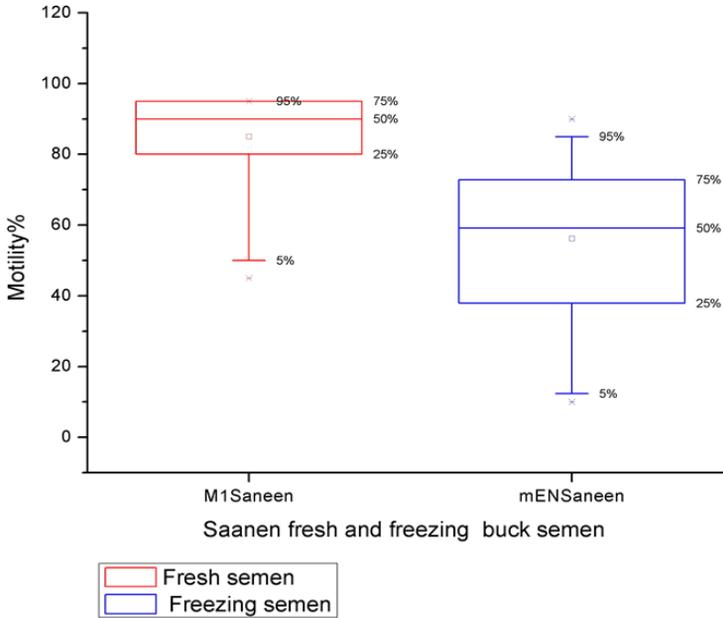
The mean motility of Alpine fresh semen was 86.81±0.88% and the coefficient of variance 8% .The mean motility for Saanen fresh semen was 85±2,24% and the coefficient of variance 14%.After defreezing, the viability mean expressed by by eosine-nigrosine colouring of semen smear, was 46.34±2.66% for Alpine semen and 56.12±4,02% for Saanen semen. The coefficient of variance were 48% and 39%,respectively, which indicated a high individual variability concerning the semen pretability to freezing (table 1)

Table 1
The cryobiological indicators of frozen semen (Alpine and Saanen)

Statistics	Alpine			Saanen		
	Volume (ml)	Motility of fresh semen (%)	Motility of freezing- thawaing semen (%)	Volume (ml)	Motility of fresh semen (%)	Motility of freezing- thawaing semen (%)
N	10	10	10	10	10	10
Mean	1,07	86,81	46,35	1,16	85	56,13
Sd(yEr±)	0,33	7,32	22,18	0,366	12,32	21,66
Se(yEr±)	0,04	0,88	2,67	0,07	2,25	4,02
Min	0,3	70	0	0,3	45	10
Max	2	95	80	1,8	95	90
Median	1	90	47,6	1,15	90	59,15
CV	31%	8%	48%	31%	14%	39%

The figure 1 shows the comparative diagram of minimum and maximum values of fresh and frozen semen:45% and 95% motility for fresh semen versus 10% and 90% for frozen semen (Saanen breed).

Figure 1 Motility of Saanen fresh and frozen semen



The individual variability concerning the semen pretability to freezing is show in figure 2 and 3, where it notice the motility dynamic of the two types of semen (fresh and frozen) from Alpine and Saanen breed.

Figure 2 Dynamics of fresh and frozen semen of Saanen bucks

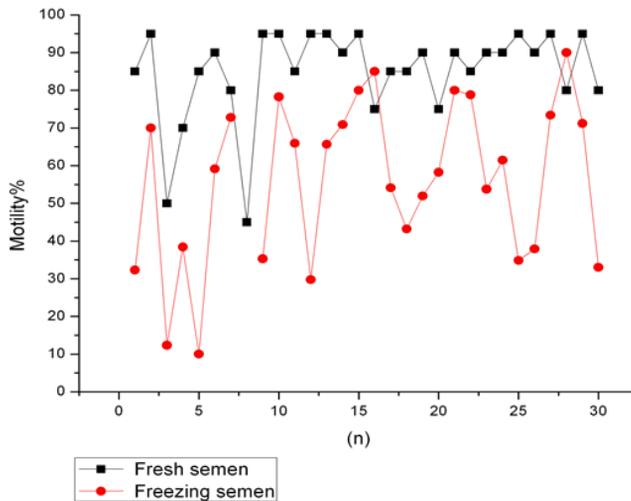
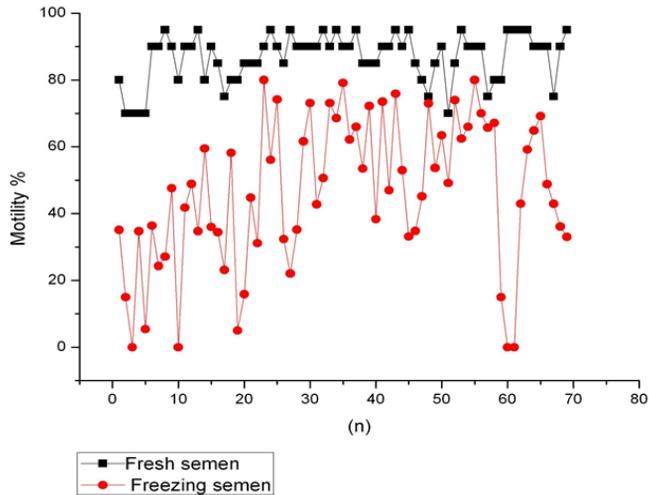


Figure 3 Dynamics of fresh and frozen semen of Alpine bucks



The fecundity was tested “in vivo” on 255 goats with induced oestrous (Chronogest, 45 mg FGA) from private farms. It was appreciated the fecundity and prolificacy percent.

The artificial insemination in single dose with frozen Saanen semen was done on 195 goats from Avram farm. The fecundity percent was 28,2%, the number of dropping

goats being 55. The prolificacy was 160%, the number of kids being 88.

On 60 goat from Boitan farm were done artificial inseminations in double doses with Alpine buck semen .The fecundity percent was 46,6 % (n=28) and the prolificacy 132% (n=37). In the table 3 are presented the fecundity result after the insemination of 382 goat and the conception rate was ranged between 51-66%.

Table 2
Conception rate after artificial insemination of goats with freezing semen(2006)

Exploitation	Female inseminated (n)	Number of inseminations	Fecundity (n/%)	Prolificacy (n/%)
1.Avram exploitation	195	1	55/ 28.2	88/160
2.Boitan exploitation	60	2	28//46.6	37/132

Table 3
Kidding rate (F %) of the goats (in induced oestrous) which were artificially inseminated with frozen sperm from bucks of Saanen breed (ICDOC Palas Constanta -October –November 2006)

Lot	Farm	Inseminated goats (n)	Fertility (%)
Lot 1	Topolog Farm (County of Tulcea)	162	59.68
Lot 2	Onesti Farm *	60	65.00
Lot 3	SC Holder Trade Farm - Baia, County of Tulcea	46	51.00
Lot 4	ICDOC Palas - biobasis	114	50.00
TOTAL		382	66.15

*- semen imported from France

CONCLUSIONS

1. The buck semen is pretable to freezing in view to preserve the genetic material.
2. The motility after freezing was 40-60%, which make possible the artificial insemination
3. A high individual variability of semen concerning pretableity to freezing it was notice.
4. Fecundity and prolificacy had high values on condition that the technologies of freezing and artificial insemination are respected.

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