ARTIFICIAL INSEMINATION OF DIARY COWS WITH PROLONGED SERVICE PERIOD WITH USE OF NATIVE BULL SEMEN DURING SUMMER PERIOD

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Summary

It was noticed that during summer period cows on all farms and in both breeding system (tied or free stall) have problems with fertility. This low fertility in this period affects fertility of the herd and necessary pregnancy rate of 82% yearly can not be achieved. During these months the bulls in reproduction centres also produce ejaculates that couldn't be frozen or the sperm is less fertile. This has considerably big effect on overall pregnancy of cows in June, July and August months in PKB Corporation every year.

In this period besides endometritis other paragenetic factors, primarily nutrition lead to prolongation of service period and high insemination index of cows. In cases when 20% of cows are affected service period can be prolonged for over 150 days.

Because of all that we’ve decided to inseminate cows with the prolonged service period (over 4 months and with 4 or more insemination), through summer period on farm Lespušnica, PKB Corporation, with fresh diluted equilibrated semen of bulls from the PKB centre.

Control of the semen was done by microscope before the each use. Semen was used up to 72 hours after collecting (preparation), was diluted in andromed and kept on temperature of 5°C. Comparation of the fertility of cows inseminated with fresh diluted semen was done in same period with the fertility of cows inseminated with deep frozen semen originating from same bulls following the plan and programme of a farm.

Key words: Prolonged service period, artificial insemination, native diluted semen, fertility, summer period.

Aim of this paper was to achieve better fertility (of minimally 82%) in dairy cows with long service period (over 150 days) by use of fresh diluted bull semen during summer period. Investigations begun in April in order to achieve better fertility in cows in June, July and August. We have noticed that during summer months each year, fertility is very low and doesn't reaches yearly fertility rate of 72% on farms of agricultural combine - Belgrade - PKB (although planned yearly fertility is on the level of 82%). Small fertility during summer months has a great impact on fertility of the herd and represents great economic loss in large animal agglomerations. Fertility of the cows inseminated with unfrozen-fresh diluted semen was compared with fertility of the cows inseminated with deep frozen semen originating from the same bulls.

Causes of lowered fertility are the result of objective and subjective factors. Endometritis of different degrees, repeated heats without noticeable clinical signs,
and other uterus disorders were present in a large number of cows, mostly during summer period. Most of the cows in summer period had three or more inseminations.

Because of all that we decided after inspection and endometritis treatment to inseminate such cows with fresh-diluted semen from the centre for semen of PKB according to existing insemination programme of a farm. Sperm was collected by method of artificial vagina, standard procedure done in the centre for semen of PKB. Upon collection, examination and evaluation, semen was diluted in Andromed extender, packed intopayets (with $3 \times 10^6$ spermatozoa per dose) and kept on the temperature of plus 5° C. Before each use sperm was controlled microscopically, progressive mobility was evaluated; it varied between 60 and 65% in checked samples of fresh diluted semen.

Diagnoses of cows gravidity was done with clinical rectal palpation of cows between 33 and 35 days after insemination, and checked on 60 days after insemination.

**Materials and methods**

After selection of Holstein-Frisian breed cows in age from three to eight years, we have done inspection, treatments and insemination of selected cows with fresh diluted and deep frozen semen. Experiment was conducted on 100 cows with long service period and with more than four previous inseminations. The 59 cows formed control group and were inseminated with deep frozen semen from the same bulls (which gave the semen for diluting fresh/diluted semen/).

Semen which was used for deep freezing, was diluted with standard extender (Biocifos), while the semen used for cooling (and was kept on plus 5° C) was diluted in Andromed and kept from two to three days depending on the motility.

Fertility of cows inseminated with fresh-diluted or deep frozen semen was checked by monitoring of the cows cycle, by rectal palpation between 33 and 44 days after insemination, and checked 60 days after insemination.

Results obtained were compared by standard statistical methods.

**Results and discussions**

In experiment which lasted from February to November 2007 year on the farm mentioned earlier 100 cows were inseminated with fresh diluted semen of bull Belvi, according to insemination programme of the farm.

In the same period 59 cows were artificially inseminated by deep frozen semen of the same bull.

Fertility of the cows by months is given in table 1.
Table 1

<table>
<thead>
<tr>
<th></th>
<th>Fresh diluted semen Cows inseminated</th>
<th>Deep frozen semen Cows inseminated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bull Belvi semen</td>
<td>April 35</td>
<td>February 65</td>
</tr>
<tr>
<td></td>
<td>August 65</td>
<td>April 18</td>
</tr>
<tr>
<td></td>
<td>February 18</td>
<td>May 24</td>
</tr>
<tr>
<td>No of pregnant cows</td>
<td>24</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>Insemination index</td>
<td>2.91</td>
<td>4.30</td>
</tr>
<tr>
<td></td>
<td>18.00</td>
<td>2.00</td>
</tr>
<tr>
<td>Pregnancy (%)</td>
<td>34.20</td>
<td>23.10</td>
</tr>
</tbody>
</table>

Pregnancy rate of the cows would long service period inseminated with fresh - diluted semen in April and August month was 34.20 and 23.10%, while the fertility of cows inseminated with deep frozen semen from the same bull in February, April and May 5.55, 50.00 and 47.05% respectively. Obtained results of fertility are showing multifactor influence of many factors, and point importance of cycle monitoring, follicle finding (in oestrus) and insemination on time, because any other explanation cannot purge away obtained results.

Results of insemination of cows with deep frozen semen from other bulls in August, September, October and November month 2007 year are given in table 2.

Table 2

<table>
<thead>
<tr>
<th></th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>November</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep frozen semen</td>
<td>236</td>
<td>266</td>
<td>265</td>
<td>252</td>
</tr>
<tr>
<td>No of pregnant cows</td>
<td>60</td>
<td>123</td>
<td>124</td>
<td>149</td>
</tr>
<tr>
<td>Insemination index</td>
<td>3.93</td>
<td>2.16</td>
<td>2.14</td>
<td>1.69</td>
</tr>
<tr>
<td>Pregnancy (%)</td>
<td>25.42</td>
<td>46.24</td>
<td>46.80</td>
<td>59.13</td>
</tr>
</tbody>
</table>

Pregnancy rate of cows inseminated with fresh diluted semen varied from 23.10 to 34.20%, but it has to be taken into consideration that this was relatively small number of cows with prolonged service period. Pregnancy of cows inseminated with deep frozen semen from other bulls in August is also very small 25.42% with high insemination index 3.93.

Pregnancy was diagnosed in 21 from 59 cows inseminated with deep frozen semen and in 27 from 100 cows inseminated by fresh-diluted semen from bull Belvi. By comparation of cows pregnancy rates of 27 (fresh-diluted semen) and 35.60% (deep frozen semen) it can be noticed that it is very difficult to do a comparison of fertility of cows in different months. These differences occur mostly due to influence of bioclimatic factors and are most significant during summer months, which is evident from the obtained results.
Pregnancy rate of cows inseminated with deep frozen semen (from other bulls) in September, October and November month is very significant, since it was n= 123, n= 124, n= 149, with insemination index from 1.69 to 2.16. All this shows that oestrus monitoring, determination of follicle phase and rational use of hormones gave good fertility ranging from 46.26 to 59.13%.

The role of fresh diluted semen, beside fertility, has justified its use in therapeutic sense during summer months when outside temperatures are very high. Plasmids of semen plasma presumably help in faster activation of uterus glands and make uterus "healthier" and ready for acceptance of inseminated ovum, embryonic development and better fertility of cows (Shannon and Vishwanath, 1995). The influence of oestral cycle and follicles in oestrus cannot be neglected when using deep frozen semen for artificial insemination, this can be easily seen from the results in September, October and November month of the same year.

Our investigations are pointing a need, due to change of bioclimatic fractures, a change in insemination habits during summer months, use of fresh diluted or native semen in order to increase fertility in cows and cure endometritis of subclinical provenience. Nutrition has unpresumably great influence in fertility, high temperatures during summer can for sure lead to subclinical rumen acidosis and negatively impact steroidogenesis in ovary and cows fertility.

Conclusions

1. It is obvious that fresh diluted bull’s semen has positive impact on cow fertility, since pregnancy rate of cows inseminated with fresh diluted semen was a higher for 10.2% compared to pregnancy rate of cows inseminated with deep frozen semen in one period of the trial.
2. Pregnancy rate in cows inseminated with frozen semen was significantly improved; insemination index was smaller after oestrus monitoring, determination of follicular phases and rational use of hormones in aperture from 46.24 to 59.13%.
3. The role of fresh diluted semen, beside fertility, is justified in therapeutic sense since uteruses are "healthier" which can be seen from better fertility and lower insemination index in months after August (results from September, October and November month 2007).
4. Our trials are pointing out the need, due to change of bioclimatic factors, to change the way of insemination of cows in summer period, by use of fresh diluted or native bull’s semen in order to increase fertility and/or treat endometritis of subclinical provenience.
5. Nutrition has big influence on fertility, high temperatures during summer can for sure lead to subclinical rumen acidosis and negatively impact steroidogenesis in ovary and cows fertility.
References


