IMPROVEMENT OF THE REPRODUCTIVE PERFORMANCES OF RAMS BY THE BIOLOGICAL ACTIVE SUBSTANCES - PLANT EXTRACT AND PROBIOTIC

Elena Kistanova

Abstract: Experiment was conducted during two breeding seasons with 6 rams of synthetic population of Bulgarian milk breed from the herd of IAS-Kostinbrod. During the first breeding season probiotic BioPro-1 was administrated to experimental rams orally, once daily with forage in dose 2g per head over one month before and through all insemination period; during the second - extract of Tribulus terrestris in dose 1.5g per head. Semen parameters as volume of ejaculate and sperm motility were evaluated. The experimental and control rams took a part in insemination of ewes according to breeding plan. The fertilizing ability of ram sperm was estimated through percent of fertilization and number of born lambs.

The addition of these biological active substances to main diet of rams has a positive effect on quality of sperm: the fertilization of ewes inseminated by experimental rams is higher than in control groups. The fertilizing ability of semen in rams treated with Tribulus terrestris extract was the highest. The delivered ewes were 72% compared to the 55% delivered ewes in control group and to the 69% in group of rams treated with probiotic.

Key words: probiotic, plant extract tribestan, sperm, rams, fertilization.

Introduction

In order to obtain a high quality and safety for human health products, it is very important to search for new ecologically clean reproductive stimulants. The main investigations are pointed in two directions. First one is the search of the plant extracts stimulated directly the reproductive system of animals. Second one is the creation of the complexes of vitamins, minerals and micro organisms. These components, stimulating the general physiological activity of an organism, render positive influence on reproductive functions, too.

The Tribulus terrestris extract is wide famous among the plant preparations. The most active components of this plant extract are saponins of the furostanol type, termed protodioscin. The effects of Tribulus terrestris preparation on human males and experimental animals are well known (Tomova et al., 1981; Viktorov et al., 1994; Cahillan et al., 2002; 2003; Brown et al., 2000, 2001; Antonio et al., 2000).

Literature data about the influence of this preparation on the reproduction of livestock animals is rather scanty. Viktorov et al.(1994) has noticed the positive effect of protodioscin on sexual behavior of male pigs with impotence.

The complex preparations as a probiotics are widely used in animal nutrition during the last time. They have a total positive effect on animal organisms (Fuller, 1994; Perdigon et al.,1995). The probiotic additives content the yeast increase the productiveness of livestock animals: sheep, pig and birds (Newbold et al.,1996; Ignatova, Stanchev, 2002; Gidev et. al., 2003). However, it is no dates how they influence the reproductive system of animals.

The aim of this investigation was to study and to compare the effect of plant extract from Tribulus terrestris and probiotic BioPro-1 on quality and fertilizing ability of ram sperm during breeding season.

Material and method

Experiment was designed during two breeding seasons with rams of synthetic population of Bulgarian milk breed from the herd of IAS-Kostinbrod. One and the same rams divided in two groups (experimental and control) were involved in this experiment. During the first breeding season probiotic BioPro-1 was administrated to experimental rams orally, once daily with forage in dose 2g per head over one month before and through all insemination period; during the second - extract of Tribulus terrestris in dose 1.5g per head.

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The additive BioPro-I is produced by Bulgarian firm “Bioextract – OOD”. It is based on yeast culture of Saccharomyces cerevisiae. The extract from Tribulus terrestris (producer Vemo Ltd, Bulgaria) contained fuurostanol saponins as 55% of protodioscin, was used.

The sperm was collected with an artificial vagina. Semen parameters as volume of ejaculate and sperm motility were evaluated.

The experimental and control rams took a part in insemination of ewes according to breeding plan. The fertilizing ability of ram sperm was estimated through percent of fertilization and number of born lambs.

Results and discussion

The figures 1 and 2 reflect the effect of biological active substances on the sperm parameters of investigated rams. These results show that the both substances have been influenced positive on sperm volume of experimental rams (Fig.1). The sperm volume of Tribestan treated rams was higher by 29% compared to the control rams in post treatment period. For BioPro -I treated rams this percent was 22% compared to the control group. The effect of Tribestan was given more expression (by 18 % compared to the BioPro-I). The sperm motility was influenced by the Tribestan, but not by BioPro-I (Fig.2). The sperm motility of Tribestan administrated rams was higher by 12 % compared to the control group during the insemination period.

The results of ewe’s insemination during two breeding seasons are shown in table 1. During the first breeding season the fertilization of ewes inseminated by BioPro-I treated rams was higher by 5 % compared to the control group. The fertility didn’t show the significant differences in two groups of ewes. These results confirm the positive effect of BioPro-I on sperm quality (Fig.1 and 2). They are in agreement with results obtained during the investigation of other rams from the heard of the Station for artificial insemination -Vidin (Kolev et al., 2003). These authors reported that the treatment with BioPro-I stored the high parameters of sperm as volume and motility as well in rams during all insemination period. May be that could explain the higher fertilization ability of their sperm despite more active use of the experimental rams for ewes insemination (52 ewes were inseminated by experimental rams compared 39 ewes by control group).

<table>
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<tr>
<th>parameters</th>
<th>Inssemated Ewes</th>
<th>Lambda Ewes</th>
<th>% fertilization</th>
<th>Born lambs</th>
<th>% fertility</th>
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<td>Control rams</td>
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<td>1st breeding season</td>
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<td>23</td>
<td>64</td>
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<td>112</td>
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<td>Experimental rams</td>
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<tr>
<td>BioPro-I</td>
<td>52</td>
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<td>69</td>
<td>41</td>
<td>114</td>
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<td>Experimental rams</td>
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<td>Tribestan</td>
<td>71</td>
<td>51</td>
<td>72</td>
<td>55</td>
<td>108</td>
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<tr>
<td>Control rams</td>
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<tr>
<td>2nd breeding season</td>
<td>29</td>
<td>16</td>
<td>55</td>
<td>17</td>
<td>106</td>
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</table>

During the second breeding season differences between the fertilization of ewes inseminated by experimental and control rams were higher compared to the first season (Table1). The use of the experimental rams for insemination was very active. By experimental rams were inseminated 79 ewes and only 29 by control rams. However, the fertilization in experimental group was by 17% higher than in control group. No considerable difference was observed in fertility between two groups. These results confirm our data about more effective influence of Tribestan on sperm parameters (Fig. 1 and 2). They are in agreement with previously data relating Tribestan effect (Kistanova et al., 2005). These data shown that the Tribulus terrestris extract increased the count of spermatozooids, time of viability and motility of sperm in rams. Moreover, all experimental rams manifested a good libido and active sexual behavior. That could be explaining the higher fertilizing ability of sperm in rams treated with Tribestan.

The fertility as a more conservative genetic trait wasn't influenced on external factors.
Conclusion

The biological active substances as BioPro-I and Tribestan can be used for improvement of the reproductive performances of rams during the breeding season.

The addition of the BioPro-I to the main diet of rams supported the high level of sperm volume during the all period of insemination. This parameter in control group decreased at the end of the insemination company. The fertilization of ewes inseminated by rams consumed BioPro-I was higher by 5% compared to the control group.

The Tribestan was more effective as male reproductive stimulant. It influenced very positive on spermatogenesis. The sperm volume and sperm motility in Tribestan treated rams was higher then in control group during all insemination period despite more active use of the experimental rams for insemination. The fertilization ability of their sperm was better, too. The percent of delivered ewes inseminated by experimental rams was 72% compared to the 55% in control group.

POBOLJŠANJE REPRODUKTIVNIH PERFORMANSI OVNOVA KORUŠČENJEM BIOLOŠKI AKTIVNIH SUPSTANCI – BILJNIH EKSTRAKATA I PROBIOTIKA

Elena Kistanova

Rezime

Da bi se dobili proizvodi visokog kvaliteta koji su bezbedni za ljudsku upotrebu, pronalazak novih ekološki čistih reproduktivnih stimulata je veoma važan.

Cilj ovog istraživanja je bio ispitivanje i poređenje uticaja ekstrakta biljke Tribulus terrestris i probiotika BioPro-I na kvalitet I spopobnost oplodavanja sperme ovnova tokom sezone parenja.

Ogled je izveden tokom dve sezone parenja na ovovima sintetičke populacije bugarske mlečne rase iz Zapata IAS - Kostinbrod. Tokom prve sezone parenja, probiotik BioPro-I je bio ekperimentalni ovovima oralno jednom dnevno u dozi od 2 g po grlu tokom perioda od mesec dana pre i tokom perioda osmenjavanja; tokom druge sezone ovovi su dobijali ekstrakt biljke Tribulus terrestris u dozi od 1,5g po grlu. Sperma je sakupljena pomoću veštinske vagine. Parametri semena kao što su zapremina ejakulata I pokretljivost su ocenjivani. Eksperimentalni i kontrolni ovovi su učestvovali u osmenjivanju ovaca prema utvrđenom planu parenja. Sposobnost oplodavanja sperme ovova je ocenjivana preko procenta oplodnje i broja rođene jagnjadi.

Biološki aktive supstance kao što su BioPro-I i Tribestan se mogu koristiti za poboljšanje reproduktivnih performansi ovnova tokom sezone parenja.

Dodavanje preparata BioPro-I obroku korišćenom u ishrani ovnova je uticalo na visok nivo zapremine sperme tokom perioda inseminacije. U kontrolnoj grupi, za navedeni parametar je registrovan pad vrednosti na kraju perioda osmenjavanja. Oplodnja ovaca osmenjenih semenom ovova koji su konzumirali preparat BioPro-I je za 5% bila bolja od kontrolne grupe.

Tribestan je bio efikasniji kao reproduktivni stimulan sa muška grla. Uticaj je pozitivno na spermatogenezu. Zapremina sperme i njena pokretljivost kod ovova tretiranih ovim preparatom su bile veće u poređenju sa kontrolnom grupom tokom perioda inseminacije iako su ogledni ovovi bili mnogo aktivnije korišćeni u inseminaciji. Sposobnost oplodavanja utvrđena za seme ovih ovova je takođe bila bolja. Procenat oplodjenih ovaca koje su oplodene semenom eksperimentalnih ovova je bio 72% u poređenju sa 55% u kontrolnoj grupi.

Ključne reči: probiotik, ekstrakt biljke Tribestan, sperma, ovnovi, oplodnja.