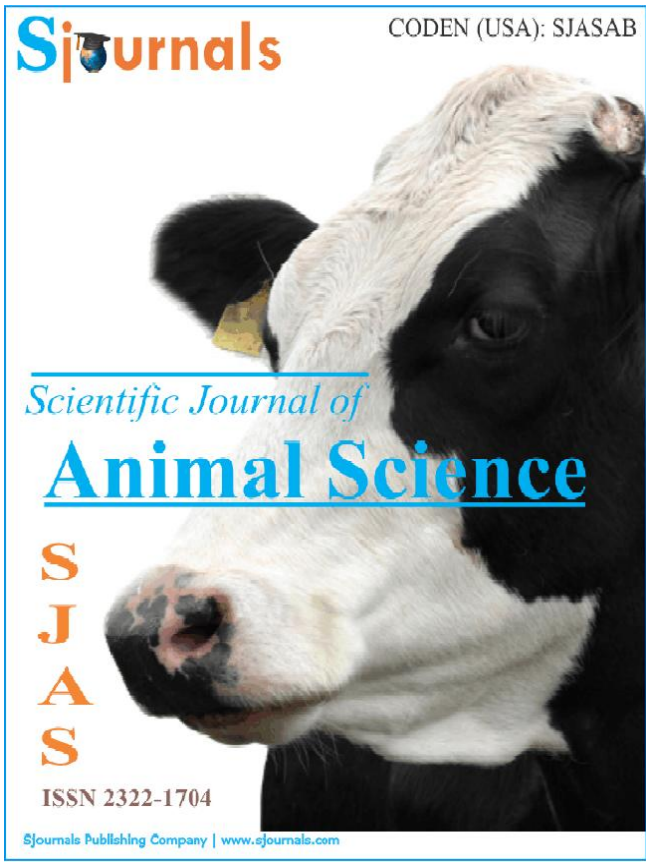

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Original article

Influence of age on sperm production's indicators of bulls

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ABSTRACT

The results obtained in the study age dynamics of indicators of sperm production of breeding bulls of black-motley and hill breeds indicate on the Republican Center of livestock breeding JSC "ASIL TYLIK" Akmola Province, Kazakhstan indicate that the quantity of the received sperm production changes by years of their use. Special differences of age dynamics between breeds it isn't observed.

1. Introduction

The most perspective way of mass increase efficiency of cattle is large-scale selection on the basis of an assessment on quality posterity of outstanding animals and use mass of the genetic material received from them (sperm, embryos, ova). The main advantage of artificial insemination containing that it allows to receive from one tribal producer many times more posterity, than at natural pairing of animals. Quality of sperm isn't constant and depends on many factors: Genotype, feeding conditions, contents, use of producers and some others. It is difficult to count all factors influencing a sperm production and despite the works directed on studying of their action, many questions remain insufficiently clear. The purpose of work is studying of a sperm production of bulls of black-motley and hill breeds in comparative aspect. Thus staged tasks to pay special attention to influence of age to

quantity and quality of seed. The material for research serval bulls - producers and tribal documents of Republican Center of livestock breeding JSC "ASIL TYLIK"Akmola Province, Kazakhstan.

2. Materials and methods

The analysis included these sperm production bulls-manufacturing of two breeds – black-motley and hill which were used for 5 years: from 2010 to 2015. All bulls were in identical conditions of feeding, the maintenance and use. Ejaculates estimated on quantitative and quality indicators: volume, density, mobility spermatozoon and their concentration. Once in a quarter the department of the chief technologist carries out an inspection of an absolute measure of survivability spermatozoon out of an organism and determination pH and resistance of sperm. Sperm with 7 mobility of spermatozoon of points and is diluted above and frozen, but if mobility of sperm is below than 7 points - discarded. Extent of dilution depends on concentration: In a dose for insemination (after sperm thawing) it must be not less than 15 million mobility spermatozoon. Sperm is subjected to deep freezing in straws (0.25 ml.) and in granules (dose volume 0.2 ml.). For carrying out researches bulls of black-motley and hill breeds, were allocated in 5 age groups. Considered the following main indicators of a sperm production:

- Quantity of ejaculates;
- Received sperm production;
- The volume of an ejaculates;
- The concentration of spermatozoon;
- The total number of spermatozoa in the ejaculate.

Information is chosen and processed biometrically taking into account the breed, age of producers.

3. Results and discussion

When studying age dynamics of the main indicators of reproductive abilities, it is possible to establish nature of their changes and duration of breeding use of bulls that allows to save up from each breeding bull a necessary reserve of sperm for its further use. We studied age dynamics of indicators of a sperm production of breeding bulls of black-motley and hill breed on Republican Center of livestock breeding JSC "ASIL TYLIK". As a result of researches it is established that at bulls of black-motley breed the volume of an ejaculate increases gradually to 4-summer age (Table 1). For this period the indicator increased by 1.08 times. At 18-month age its volume makes 89.6%, at two-year age of -94.4%, and in three-year-old -99.3% of the volume of an ejaculate of adult bulls. Concentration of spermatozoa in 1 ml of sperm changes slightly for the entire period of supervision. The total spermatozoon in an ejaculate of breeding bulls of black-motley breed increases also to 4-year age, by 1.14 times. The observed an increase in quantity of ejaculates till third year of use by 2.99 times ($P<0.001$), and then till last year uses doesn't change.

Table 1
Sperm production indicators of breeding bulls of black-motley breed depending on age.

Index	Year of use				
	I	II	III	IV	V
The number of bulls	20	18	13	12	10
The number of ejaculates	57.1±10.1	151.3+9.5	171.2+6.0	170.3+7.4	170.3+8.0
Retrieved sperm production, ml	172.2±34.8	587.6+45.1	685.4±62.2	707.3+73.9	584.9+78.6
The volume of ejaculate, ml	3.69±0.07	3.89+0.08	4.09±0.16	4.29+0.23	4.12+0.23
The concentration of spermatozoa billion / ml	1.06±0.04	1.08±0.04	1.06+0.07	1.07+0.06	1.06+0.05
The total number of spermatozoa in the ejaculate, billion.	3.94±0.18	4.20±0.16	4.31+0.27	4.50+0.23	4.36+0.32

At bulls of hill breed (Table 2) the volume of an ejaculate increases till 5 years, by 1.13 times. At 18-month age the volume of an ejaculate makes 74.5%, at two-year age -91.4% and three-year-old -94% of the volume of an ejaculate of adult bulls. It means that manufacturing bulls already at 1.5-3-year age have rather high rates of volume of an ejaculate. At the hill of bulls throughout the entire period of use a gradual reduction in spermatozoa

concentration in process of increasing volume of an ejaculates is observed, since first year of a capture of sperm and finishing with the last. The total spermatozoon in an ejaculate increases to 3-year age, by 1.2 times (P<0.01). The quantity of ejaculates increases from the first to the third year of receiving sperm by 2.39 times (P<0.001), then changes not significantly.

Table 2
Sperm production indicators of breeding bulls of hill breed depending on age.

Index	Year of use				
	I	II	III	IV	V
The number of bulls	22	22	22	15	12
The number of ejaculates	59.5±8.1	122.9±8.2	142.2±5.4	138.5±4.2	164.7±10.5
Retrieved sperm production, ml	329.1± 48.3	791.3±57.7	962.8±66.3	998.6±116.2	1167.3±74.4
The volume of ejaculate, ml	5.3±0.2	6.5±0.2	6.7±0.2	7.1±0.3	7.11±0.2
The concentration of spermatozoa billion / ml	0.95±0.02	0.92±0.02	0.89±0.02	0.88±0.02	0.87±0.01
The total number of spermatozoa in the ejaculate, billion.	5.00±0.23	5.92±0.22	5.98±0.1	5.88±0.55	5.75±0.53

The quantity, the received sperm production also changes by years of use. Special differences in age dynamics between breeds, it isn't observed. For both species observed a significant increase in sperm from the first year to the second year: In 2.4 for bulls of black-motley breed, in 3.4 for hill (P<0.001) that is explained by formation of reproductive function and strengthening of spermatogene and secretion functions of sexual glands. Breed bulls from the second to the last year of use has been a gradual increase in quantity of a sperm production is observed. At bulls of black-motley breed the increase in a sperm production is also noted with age, but only on the fifth year of use decrease in quantity of the received sperm production is noted. The reason of decrease in sexual activity, and as a result, sperm production, underestimation of selection of bulls on their reproductive ability, incorrect of exploitation, a deficiency of exercise, a disease of joints which especially often meet at bulls with a high live weigh.

4. Conclusion

It is revealed that the bulls of hill breed the volume of an ejaculates increased gradually to 5-year age, at black-motley breed - to 4 years. Change of concentration of spermatozoa in an ejaculates by years of use variously. At black-motley bulls concentration of spermatozoa changed slightly, and at the hill of bulls gradual reduction in the concentration of spermatozoa in process of increase in volume of an ejaculates was observed.

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