Efficiency of obtaining twins by using embryo transfer in artificially inseminated dairy cows

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Introduction

The study herd was a livestock of cattle in the conditions of Limited Liability Company (LLC) "Agricultural enterprise Nikolaevskoye", the village Lugovets, Mglinskydistrict, Bryansk region, the Russian Federation.

To increase the LLC's beef meat production a study was conducted to determine the efficiency of obtaining twins by using embryo transfer (ET) in artificially inseminated (AId) dairy cows.

Methods

Recipient cows were divided into three groups depending on the breed of the animals. Group I consisted of 22 Swiss cows, group II of 13 Russian black-and-white cows, and group III of 15 cross breed cows. All selected cows were AId with female sex-sorted Belgian Blue semen.

On the 7th day after insemination, frozen-thawed female embryos obtained from Hereford donor cows inseminated with sex-sorted Hereford X-semen were transferred into all recipients.

The pregnancy diagnostics and determination of the number of developing fetuses in the uterus were carried out using ultrasound scanning on the 45th day after insemination of the cows.

Calvings were supervised 24 h a day and special monitoring included the cows diagnosed with twins. There were no stillbirths nor calves born dead.

Twin producers: Swiss cows

Twin producers: cross breed cows

Results

The results were analyzed using the t test in the GraphPad Prism 7 program. Significance was considered at $P < 0.05$.

Of the recipients in the groups I, II and III, 45.5 % (10/22), 15.4 % (2/13) and 20.0 % (3/15) had twins, respectively.

An ET-derived calf was born to 18.2 % (4/22), 23.1 % (3/13) and 33.3 % (5/15) of the recipients in the groups I, II and III, respectively.

An AI-derived calf was born to 31.8 % (7/22), 38.4 % (5/13) and 40.0 % (6/15) of the recipients in the groups I, II and III, respectively.

The remaining cows in each group had no calf.

Conclusions

The percentage of twin offspring was significantly higher ($P \leq 0.01$) in the group I compared to the groups II and III. In the groups I, II and III, total calf yield was 140.9 % (31/22), 92.3 % (12/13) and 113.3 % (17/15), respectively.

The Russian black-and-white cows were inferior twin producers compared to Swiss and cross breed cows which were excellent and moderate, respectively, twin producers.