

EVALUATION OF HOLSTEIN COWS ORIGINATED FROM EMBRYO TRANSFER

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Abstract

This thesis deals with the evaluation of milk yield of Holstein cows that come from embryotransfer (ET). All data for the experiment evaluation was obtained from an agricultural cooperative, which is located in the region Pardubice. In the experiment, we evaluated the performance of daughters from embryo transfer and compared their performance with their peers (not from ET) born in the same stable and the same years. Performance evaluation was obtained during the first and second lactation. From the results, where the production performance is compared, it was evident that there was no statistically significant difference in production difference between dairy cows from ET and their peers.

Keywords: reproduction, milk yield, cows, embryotransfer, donor

INTRODUCTION

Embryotransfer (ET) in the context of dairy cows, is commonly used as a tool for genetic improvement. In addition, ET can be used to increase the reproductive efficiency of herds, especially among cows that live in specific physiological conditions such as heat stress (Oliveira, 2016). Embryotransfer has multifaceted and broad importance. It is still a popular technique in cattle breeding that achieves top performance (Ježková, 2020). It interferes with the reproduction and breeding of cattle (Vaněk *et al.*, 2002). For all livestock species, the result of embryo transfer depends mainly on the quality of the recipients and the quality of the embryos. If the embryo meets the morphological criteria, it can be referred to as usable embryo.

MATERIAL AND METHODS

All data for the experiment evaluation was obtained from an agricultural cooperative, which is located in the region Pardubice. Dairy cows that were selected as donors achieved three lactations. As a result, they produced 12 819 kg of milk. The fat content was around 3.99% and the protein content was around 3.21%. The fat content in kg was 509 kg and the protein content was 410 kg. In the experiment, we evaluated the performance of daughters from embryo transfer and compared

their performance with their peers born in the same stable and the same years. Performance evaluation was obtained during the first and second lactation. The main utility parameters that were monitored are the efficiency during lactation with the protein and fat content in relative and absolute terms.

RESULTS

Tab. I shows the effect of embryo transfer on milk yield. The milk content from ET dairy cows averaged $11\,445 \pm 2\,634$ kg. The values from peers averaged between $11\,214 \pm 2\,311$ kg. There was no statistically significant ($p > 0.05$) difference between dairy cows. The fat content from ET dairy cows averaged $3.98 \pm 0.41\%$. For their peers, the values ranged on average $3.98 \pm 0.39\%$. No statistically significant ($p > 0.05$) difference was found in fat content (kg). The values for dairy cows from ET averaged 452 ± 98.81 kg. The values from peers were the same, with a fat content averaging 452 ± 56.88 kg. There was no statistically significant ($p > 0.05$) difference in milk production between dairy cows derived from ET and their peers (Tab II). It was also proven that there is no significant difference in relative and absolute milk fat content. Dairy cows from ET produced an average of $11\,150 \pm 2\,774$ kg of milk, which is on average about 1 066 kg more than the production from their peers. Peers produced an average of $10\,084 \pm 2\,689$ kg

of milk. Regarding the fat content from ET dairy cows, the values ranged from $3.79 \pm 0.33\%$. The fat content of their peers was almost comparable to $3.78 \pm 0.36\%$. The absolute fat content from ET dairy cows was 420 ± 99.70 kg. The values of their peers were 41 kg lower (379 ± 100.23 kg). The values in ET dairy cows averaged $3.35 \pm 0.19\%$ and their peers had a protein content of $3.35 \pm 0.20\%$ in milk. Higher absolute protein content (374 ± 93.38 kg) was demonstrated in ET dairy cows. Their peers produced 337 ± 88.44 kg of proteins during lactation. There was no statistically significant ($p > 0.05$) difference between the monitored protein contents. The amount of protein in ET dairy cows reached a similar average of $3.27 \pm 0.17\%$ as in contours on average $3.27 \pm 0.21\%$. The average protein content of dairy cows from ET was 373 ± 80.84 kg, the average protein content of their peers was 374 ± 53.51 kg. The higher absolute protein content (374 ± 93.38 kg) was demonstrated at ET dairy cows. Their peers produced 337 ± 88.44 kg of proteins during lactation.

DISCUSSION

From the results shown in Tab. I and Tab. II, where the production performance is compared, it is evident that there was no production difference between dairy cows from ET and their peers. Their values in milk, fat, and protein production were similar. A smaller difference was recorded in Tab. II, where 11 150 kg of milk was obtained from dairy cows from ET and 10 084 kg of milk was obtained from their peers. The other values of milk components don't differ. The author Szabari (2008) stated in his work that there was a smaller difference in milk production between dairy cows that are from ET and are not from ET. Dairy cows from ET produced an average of 8 762 kg and their peers produced an average of 8 419 kg of milk. Furthermore, in his publication, the author stated that most dairy cows from ET reach a maximum of 2 lactations and then they are excluded for health reasons.

I: Comparison of performance between dairy cows from ET and their peers born in 2015, 2016

Cows	Number	Milk (kg)	Fat (%)	Fat (kg)	Protein (%)	Protein (kg)
from ET	43	11 445 \pm 2 634	3.98 \pm 0.41	452 \pm 98.81	3.27 \pm 0.17	373 \pm 80.84
peers	42	11 214 \pm 2 311	3.98 \pm 0.39	452 \pm 56.88	3.27 \pm 0.21	374 \pm 53.51

II: Comparison of performance between dairy cows from ET and their peers born in 2016, 2017

Cows	Number	Milk (kg)	Fat (%)	Fat (kg)	Protein (%)	Protein (kg)
from ET	38	11 150 \pm 2 774	3.79 \pm 0.33	420 \pm 99.70	3.35 \pm 0.19	374 \pm 93.38
peers	38	10 084 \pm 2 689	3.78 \pm 0.36	379 \pm 100.23	3.35 \pm 0.20	337 \pm 88.44

CONCLUSION

When comparing dairy cows that came from ET with their peers, milk yield doesn't differ significantly. Dairy cows from ET were as productive as their peers. A smaller difference was found when dairy cows from ET had slightly higher milk production. The content of milk components of fat and protein was balanced between both dairy cows. In my dissertation I would like to continue the analysis of cattle reproduction, in relation to milk yield and in relation to the exterior of the Czech Fleckvieh breed. Monitoring and evaluation will take place in a company located in the South Moravian Region. Agricultural cooperative keep breed Czech Fleckvieh. All research data will be collected and evaluated for a period of five years and will cover reproduction, performance control, exterior evaluation and activometer.

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