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Article

Immunization against Gonadotropin-Releasing Hormone in Female Beef Calves to Avoid Pregnancy at Time of Slaughter

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Simple Summary: Precociousness of heifers kept in mixed beef herds with young and adult bulls leads to unwanted pregnancies. Inbreeding, premature calving followed by dystocia and a high stillbirth rate are the consequences. As an alternative, such heifers are slaughtered during the resulting pregnancy. The slaughtering of pregnant animals is an ethical problem, which is strongly criticized by consumers and animal welfare organizations. Therefore, the aim of this study was to postpone puberty in female beef calves housed in Swiss mixed herds to avoid pregnancy until scheduled slaughter at 11 months of age. We used a vaccine (Improvac®) that induces antibody production against sexual hormones, thereby suppressing the reproductive cycle. Monthly progesterone analysis in blood was performed to decide whether the cycle had already started. The results proved, that vaccinated female beef were not coming in heat until 11 months of age compared to the unvaccinated control group, which came in heat earlier. In conclusion, vaccination with Improvac® is an animal-friendly, non-invasive and reliable method to avoid early pregnancy in heifers as well as the slaughter of pregnant cattle.

Abstract: Precocious puberty in beef heifers can result in unwanted pregnancies due to accidental breeding by farm bulls. Inbreeding, premature calving followed by dystocia and a high stillbirth rate or slaughtering of pregnant heifers are the consequences of this behaviour. The aim of the study was to postpone puberty by using Improvac®, an anti-GnRH vaccine. Therefore, $n = 25$ calves were twice vaccinated, once at the age of 5 and then at 6.5 months. $n = 24$ calves served as unvaccinated case controls. The onset of puberty was assigned if progesterone analysis in the blood exceeded 1 ng/mL. Progesterone values were excluded if the corresponding serum cortisol levels were $\geq$60 nmol/L. Our target was met, as in the vaccinated group none of the calves exceeded a progesterone value >1 ng/mL until the scheduled age of slaughter at 11 months and only 12.5% of the animals exceeded a progesterone value of 1 ng/mL over the whole measuring period (>400 days) compared with 56.5% of the calves in the control group. In conclusion, the favourable results from our study using the vaccine Improvac® represent an animal-friendly, non-invasive and reliable way to avoid early pregnancy in heifers as well as the slaughter of pregnant cattle.

Keywords: cattle; anti-gonadotropin-releasing hormone (anti-GnRH); Improvac®; immunocastration; puberty; progesterone; cortisol

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1. Introduction

The herd size of beef cow-calf operations in Switzerland are small where male and female animals of all age groups are housed together. There is often no possibility to split up the herd (only one free stall housing available, not many different pastures per farm).