Non-invasive Urine Sampling and Pregnancy Diagnosis in Domestic Cattle and Alpacas

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Introduction

Monitoring of reproduction and pregnancy diagnosis are very important and decisive tasks for successful breeding of every mammalian species in captivity [1]. However, every handling or medical examination of bigger ungulates needs physical or chemical restraint which is dangerous for both animal and personnel, and also very stressful for animals [2]. Non

Aims

- to examine non-invasive urine sampling in Fleckvieh heifers (Bos taurus) and female Alpacas (Vicugna pacos)
- to evaluate two simple methods for pregnancy diagnosis: Cuboni reaction and Barium chloride test.
- to assess the application of these methods in big ungulates

Materials and methods

Animals

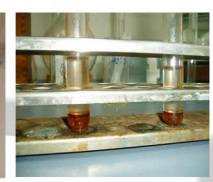
Twelve female alpacas from three Czech private farms and twenty pregnant and twenty non-pregnant Fleckvieh heifers from Czech dairy farm, were included into study. The females included into the project were well tamed and their pregnancy was confirmed routinely by veterinarians by ultrasound and blood progesterone tests at these farms. The term of parturition

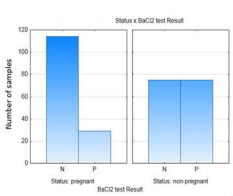
Sample collection

Urine was non-invasively collected into half litre plastic cup fastened on telescopic rod. Urine sampling was done during standing,laying and walking position of tested animal. Samples were obtained repeatedly in regular intervals

Methodology and sample evaluation

The Cuboni reaction was tested in the State Veterinary Institute (SVI) Prague. This test is based on fluorescent reaction of urinary estrogens with benzene, hydrochloric acid and sulfuric acid[3, 4]. For the barium chloride test, 5 ml of 1% solution of BaCl2 was added into 5 ml of urine [5] wher as a clear solution is indicative of pregnancy [6]. Data were statistically evaluated in the StatisticaCz 12 program (StatSoft, Inc.2013).





Results and conclusion

Non-invasive urine collection into plastic cup fastened on telescopic rod was assessed as suitable method how to obtain urine from big ungulates bred in extensive facilities or spacious stables. This way of urine sampling was considered as non-stressfull and comfort for tested animals

As for chemical pregnancy tests, **in heifers the results of Barium chloride test were influenced by pregnancy** (Graph 1). Urine of pregnant animals reacted negatively, the test marked animals truthfully as pregnant, in 79.7% cases. On the other hand, reliability in detection of non-pregnant females was 50% only. **The connection between Cuboni reaction and accurate pregnancy diagnosis was statistically not confirmed, as well as in alpaca females. In case of Barium chloride test no relationship was found between the alpaca´s reproductive status and the results of the barium chloride test.** The test was not reliable even if it was assessed for non-pregnancy versus pregnancy (Pearson's chi-squared test: $\chi2 = 1.61$, df = 1, p = 0.21), halves of pregnancy (Pearson's chi-squared test: $\chi2 = 1.62$, df = 2, p = 0.44), or thirds of pregnancy (Pearson's chi-squared test: $\chi2 = 1.94$, df = 3, p = 0.59).

It was concluded that the barium chloride test and the Cuboni reaction are not suitable for pregnancy diagnosis in alpacas. On the other hand barium chloride test examined in Fleckvieh cows showed a potential of this method for pregnancy diagnosis in contrast to Cuboni reaction.

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