Abstract Submission Form

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Preferred presentation

Poster

Preferred session

Session 7: Breeding for agroecological transition in sheep and goats

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Title of your paper　　　Early Detection of Multifetal Pregnancies in Alpine Goats Using Pregnancy-Associated Glycoprotein (PAG) Concentrations in Milk

Insert ABSTRACT text

The nutritional metabolic demands and foetal development needs of pregnant goats carrying multiples (≥3 fetuses) are significantly different from those of single and twin pregnancies, including requirements for energy, protein, and minerals. Early prediction of the number of fetuses can allow for timely adjustment of management practices for goats pregnant with multiples. In this study, milk samples from 348 pregnant Alpine goats were collected and analysed for PAG concentrations during early (10−43 days), mid (49−78 days), and late (85−94 days) pregnancy. To evaluate the number of fetuses in Alpine goats during early pregnancy and to assist dairy farmers in corresponding reproductive management, receiver operating characteristic (ROC) curve analysis was used to determine the sensitivity, specificity, and area under the curve (AUC) for different PAG concentration thresholds at various days of pregnancy. In this research, the fetus number of 1, 2, and 3 or more kids accounted for 21%, 71%, and 8% of total pregnant goats, respectively. The results showed that at 49 days of pregnancy, a milk PAG threshold of 1.208 for

determining multiple pregnancies had a sensitivity of 100%, a specificity of 80.6%, and an AUC of 0.903; at 57 days of pregnancy, a milk PAG threshold of 2.643 resulted in a sensitivity and specificity of 100% with an AUC of 1. Moreover, the Youden index at 57 days was higher than at 49 days (200% vs. 180.6%). We then used Canonical Discriminant Analysis (CDA) to evaluate the significant differences between the groups of multiple and single or twin pregnancies based on different milk PAG concentration thresholds and days of pregnancy. Starting from 49 days of pregnancy, the Wilk's Lambda value was 0.786, indicating a significant difference in milk PAG concentrations between goats with multiples and those with single or twin fetuses (P < 0.01); at 57 days of pregnancy, the Wilk's Lambda value was 0.104, denoting a highly significant difference (P < 0.001). It is concluded that 49 to 57 days of pregnancy are effective timepoints to use milk PAG concentrations to differentiate the number of fetuses in pregnant Alpine goats.