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Assessment of the effects of heat stress on the reproductive performance of heifers during breeding season

ity indices steadily declined ($P < 0.0001$) in UMA, DV and AO until wk 18 of examination. Conversely, after wk 19 UMA-PI and UMA-RI ($P < 0.0001$ and $P < 0.005$, resp.) increased. In goats, there were positive correlations between UMA-TAMV and DV-TAMV ($r = 0.88$, $P < 0.0001$), UMA-TAMV and AO-TAMV ($r = 0.91$, $P < 0.0001$) as well as UMA-PI and DV-PI ($r = 0.84$, $P < 0.0001$), UMA-PI, AO-PI ($r = 0.80$, $P < 0.0001$) and AO-TAMV and FHR ($r = 0.41$, $P < 0.007$). Negative correlations were noticed between FHR and UMA-TAMV ($r = -0.396$, $P < 0.002$); FHR and DV-PI ($r = -0.395$, $P < 0.01$). Similar results were obtained in sheep: There were positive correlations between UMA-TAMV and DV-TAMV ($r = 0.91$; $P < 0.0001$) and UMA-TAMV and AO-TAMV ($r = 0.90$; $P < 0.0001$) as well as between UMA-PI and DV-PI ($r = 0.80$; $P < 0.0001$), UMA-PI and AO-PI ($r = 0.66$; $P < 0.0001$). On the other hand, FHR was negatively correlated with UMA-TAMV ($P = -0.74 < 0.0001$). The FHR increased gradually from 111 ± 18.9 bpm vs. 121 ± 19.4 bpm at wk 4 to 250 ± 13.6 bpm vs. 250 ± 21.6 at wk 8 of pregnancy and then decreased to 136 ± 6.6 bpm vs. 136 ± 4.7 bpm at wk 20 in goats and sheep respectively.

Conclusions: The results of this study indicate that color Doppler sonography is a successful non-invasive method for monitoring fetal blood flow and heart rate characteristics in small ruminants.

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Advance of the breeding season and artificial insemination with frozen semen in Portuguese Serrana Goats

Valentim Corujeira, R.; Cortez Cardoso Azevedo M.; De Azevedo Teixeira J.; Pereira Sá F.; De Mendonça Pegado Lemos Á.; Quintas Miranda Pires H.; Maurício Álvares Serrão R.; Simões Caetano J.; Barbosa Pires L.; Correia Montenegro De Araújo Almendra T.

Instituto Politécnico de Bragança, Escola Superior Agrária, Portugal

Objectives: This study aimed to compare the efficiency of melatonin and/or a short-term FGA treatment in the advance of the breeding season in Serrana goats. Fertility after artificial insemination (AI) with frozen semen was also assessed.

Materials and Methods: This experiment took place at Bragança (latitude $41^\circ 49' N$, longitude $6^\circ 40' W$ and altitude 720 meters) and involved 65 adult Serrana goats. At early March, 32 goats received a melatonin implant (18 mg) – melatonin group. The other 33 remained as control group. Fifty days later all goats were injected with 100 micrograms of PGF₂alpha. Simultaneously a vaginal sponge with 20 mg of FGA was inserted in each goat. Progestagen treatment lasted for 5 days. At sponge removal all goats were injected with 300 UI of eCG. Later, 15 goats of each group were artificially inseminated ($n = 30$) with frozen semen (AI group). The lasting 35 goats were inseminated by intact males provided with harness markers for heat detection (NB group). Ovarian activity was assessed by progesterone (P4) plasmatic levels 2 weeks before melatonin and short-term FGA treatments and for 5 days after eCG injection. Pregnancy diagnosis was performed 41 days after eCG administration by real time ultrasonography.

Results: In the fortnight prior to melatonin treatment 49.2% of all goats had high levels of P4 (> 0.5 ng/ml). In the previous 2 weeks to short-term FGA treatment 6.1% of control and 71.9% of melatonin goats had high levels of P4 (Chi-square = 91.6; $P = 0.001$). Over 88.6% of NB goats showed sexual behavior. About 83.3% were control and 94.1% melatonin treated goats (Chi-square = 5.9; $P = 0.05$). Eighty percent of all goats had high levels of P4 1 to 5 days post eCG injection. About 81.3% were control and 78.1% melatonin treated goats (Chi-square = 0.3; $P > 0.05$). No significant difference was found between NB and AI goats – 82.9% vs. 76.7% (Chi-square = 1.1; $P > 0.05$). Forty-one days after eCG administration, 78.5% of all goats were pregnant. About 78.8% were control and 78.1% melatonin goats (Chi-square = 0.0; $P > 0.05$). Fertility rate was higher in NB than in AI goats – 85.7% vs. 70.0% (Chi-square = 7.5; $P = 0.01$).

Conclusions: – Melatonin enhanced both the percentage of goats presenting high levels of P4 (> 0.5 ng/ml) and the percentage of goats in estrus. – Melatonin had no significant effect in the ovarian activity following short-term FGA treatment. – Fertility rate was higher in NB than in AI goats. – AI with frozen semen resulted in a quite high fertility rate (70.0%).

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The use of a sonomicrometry system for monitoring uterine involution in cows post partum

Heppelmann, M.; Heppelmann M.; Krach K.; Krueger L.; Benz P.; Herzog K.; Piechotta M.; Hoedemaker M.; Bollwein H.

Clinic for Cattle, University of Veterinary Medicine Hannover, Germany

Objectives: An undisturbed uterine involution is a prerequisite for a good reproductive performance. All techniques to assess the uterine involution have in common, that they do not provide objective results about the reduction in size especially in the first few days after parturition. The sonomicrometry system (Sonometrics Corp., London, Ontario, Canada) which measures the distance between two piezoelectric crystals has been widely used to investigate contractility of the heart and the gastrointestinal tract. The aim of this study was to establish this system as a technique for the measurement of the uterine involution after parturition.

Materials and Methods: Sonometric measurements were performed in seven healthy pluriparous Holstein Friesian cows. Four piezoelectric crystals (1-4) were implanted three weeks before parturition via laparotomy into the myometrium of the great curvature of the pregnant horn in a longitudinal direction with distances of approximately 10 cm between crystals. Daily measurements were conducted from 2 days before parturition until 14 days after calving. Thereafter, sonometric measurements were carried out every other day until day 28. Changes in distances between the crystals were presented as relative changes (%) with respect to a basic value before parturition. Beginning 10 days after calving, the diameter of the formerly pregnant uterine horn was measured using transrectal B-Mode sonography. 39 \pm 6 days after parturition cows were slaughtered and the uterus was investigated for fixation of the crystals.

Results: The distances between crystals showed similar alterations after parturition. On day 1 after calving, there was a reduction of more than 50%. In the second week post partum, the changes were reduced by 15% ($P < 0.05$). In all other weeks, changes in distances between crystals were not influenced ($P > 0.05$) by day post partum. The diameter of the formerly pregnant horn was related to distances between crystals 1-2 ($r = 0.54$; $P < 0.01$), 2-3 ($r = 0.43$; $P < 0.01$) and 3-4 ($r = 0.63$; $P < 0.01$). Examination of the uterus after slaughter of the cows revealed that 29% ($n = 8$) of the crystals were not fixed any more in the myometrium. The signals of sonometric measurements of those 8 crystals showed good ($n = 3$; 38%), moderate ($n = 4$; 50%) and poor ($n = 1$; 12%) qualities.

Conclusions: The results of this study suggested that the sonomicrometry system is a suitable technique to evaluate objectively uterine involution after parturition.

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Evaluation of the teratogenicity of Ipomoea carnea: study in goats

Gotardo Tadeu, A.; Gotardo Tadeu A.; Schumacher Henrique B.; Pfister Alan J.; Traidi De Souza A.; Spinosa De Souza S.; Górniak Lima S.

Universidade de São Paulo, Brazil

Objectives: *Ipomoea carnea* (I. carnea) is a plant that is widely distributed in northeastern Brazil and in other tropical countries. Intoxication of livestock that chronically ingest this plant has been reported in several tropical countries, with goats often the main affected species. I. carnea contains the indolizidine alkaloid, swainsonine, as well as toxic calystegines. Related plants worldwide are *Astragalus* and *Oxytropis* species (so-called locoweeds), however these two genera do not contain the additional toxic calystegines. Swainsonine and calystegines cause cellular accumulation of oligosaccharides, due to inhibition of several important enzymes, resulting in cellular vacuolization and cell death. Studies in rats treated with IC showed alterations in fetal development. The objective of the present study was to study the perinatal effects of I. carnea in goats; ultrasonography was used to measure fetal movement and development for early diagnosis of teratogenesis.

Materials and Methods: forty-seven pregnant goats were randomly allocated into 5 treatment groups and given the following doses (g/kg BW) of