

OVINOS y CAPRINOS

ABORTOS en ovejas

Brote epizootiológico por Salmomella abortus ovis 2005 en Suiza.

[Abortion in sheep: epidemic Salmonella abortusovis outbreak 2005 in Switzerland]

Schweiz Arch Tierheilkd. 2005 Oct; 147(10):445-52.

[Article in German]

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In spring 2005, the outbreak of contagious abortion caused by Salmonella Abortusovis in 6 sheep flocks in Switzerland led to considerable economic losses. The Swiss small ruminant health service (BGK) evaluated this case. The aim was to identify the source of the epidemic in order to avoid further spread of infection and to evaluate the possibility of using vaccination. Moreover, a strategy for prevention of future outbreaks was developed. This article aims to increase disease awareness of food animal practitioners for Salmonella Abortusovis abortion in sheep.

ANOMALÍA SEXUAL en un caprino

Investigaciones genética, histológica y anatómica.

Anatomical, histological and genetic investigations of a sexually anomalous goat.

Vet Rec. 2005 Oct 22; 157(17):513-6.

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An apparently female goat was masculine in appearance and had strong male-pattern libido and behaviour. The goat's DNA was subjected to PCR analysis and its reproductive system was examined anatomically and histologically. The external genitalia consisted of an apparent vulva in the normal position and a grossly enlarged clitoris. Two masses could be palpated lying subcutaneously in the inguinal region; when they were removed they had the macroscopic appearance of hypoplastic testes, and histologically they had atrophic tubules and prominent interstitial tissues. To exclude sex chimaerism, X and Y chromosome-specific targets were amplified by PCR, using bone marrow and muscle DNA templates. The goat had some Y chromosome-specific sequences such as SRY and BRY.I but lacked others, such as BOV97M.

BIOESTIMULACIÓN

Cambios endócrinos y ováricos en respuesta al efecto del carnero, en ovejas Corriedale tratadas con acetato de medroxiprogesterona, durante la estación de la reproducción o no.

Endocrine and ovarian changes in response to the ram effect in medroxyprogesterone acetate-primed Corriedale ewes during the breeding and nonbreeding season.

Acta Vet Scand. 2005; 46(1-2):33-44.

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Two experiments were performed to determine the endocrine and ovarian changes in medroxyprogesterone acetate (MAP)-primed ewes after ram introduction. Experiment 1 was

performed during the mid-breeding season with 71 ewes primed with an intravaginal MAP sponge for 12 days. While the control (C) ewes (n = 35) were in permanent contact with rams, the ram effect (RE) ewes (n = 36) were isolated for 34 days prior to contact with rams. At sponge withdrawal, all ewes were joined with eight sexually experienced marking Corriedale rams and estrus was recorded over the next 4 days. The ovaries were observed by laparoscopy 4-6 days after estrus. Four weeks later, pregnancy was determined by transrectal ultrasonography. In eight ewes from each group, ovaries were ultrasonographically scanned; FSH, LH, and estradiol-17beta were measured every 12 hours until ovulation or 96 hours after estrus. The response to the rams was not affected by the fact that ewes had been kept or not in close contact with males before teasing. No differences were found in FSH, LH, estradiol-17beta concentrations, growth of the ovulatory follicle, onset of estrus, ovulation rate, or pregnancy rate. Experiment 2 was performed with 14 ewes during the nonbreeding season. Ewes were isolated from rams for 1 month, and received a 6-day MAP priming. Ovaries were ultrasonographically scanned every 12 hours, and FSH, LH, estradiol-17beta, and progesterone were measured. Ewes that ovulated and came into estrus had higher FSH and estradiol-17beta levels before introduction of the rams than did ewes that had a silent ovulation. The endocrine pattern of the induced follicular phase of ewes that came into estrus was more similar to a normal follicular phase, than in ewes that had a silent ovulation. The follicle that finally ovulated tended to emerge earlier and in a more synchronized fashion in those ewes that did come into estrus. All ewes that ovulated had an LH surge and reached higher maximum FSH levels than ewes that did not ovulate, none of which had an LH surge. We conclude that (a) the effect of ram introduction in cyclic ewes treated with MAP may vary depending on the time of the breeding season at which teasing is performed; (b) patterns of FSH, and estradiol-17beta concentrations, as indicators of activity of the reproductive axis, may be used to classify depth of anestrus; and (c) the endocrine pattern of the induced follicular phase, which is related to the depth of anestrus, may be reflected in the behavioral responses to MAP priming and the ram effect.

Efecto macho en Ovejas.

The effect of individual liveweight and use of teaser rams prior to mating on the reproductive performance of ewe hoggets.

N Z Vet J. 2005 Oct; 53(5):340-3.

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AIM: To determine the effects of liveweight (LW) and use of teaser rams prior to mating on both the mating performance and pregnancy rate of ewe hoggets. METHODS: Romney hoggets (n=841) were weighed and randomly assigned to one of two treatment groups; either exposed to seven harnessed, vasectomised (teaser) rams for 17 days prior to the breeding period (n=283); or not exposed to teaser rams (unteased, n=558). Harnessed Perendale rams were then introduced for two oestrous cycles. Using crayon marks, hoggets were identified as having been mated during the first 17 days only, during the second 17 days only, during both periods, or not mated. All mated hoggets were then scanned for pregnancy using ultrasound, 48 days after the end of the breeding period, and identified as being either non-pregnant, or as single-, twin or triplet-bearing. RESULTS: Hoggets mated in either the first 17 days only or in both the first and second 17-day periods were heavier than those mated in the second period only (p<0.001). Those mated in the first or second 17-day period only, and those mated in both periods were all heavier prior to mating than those not mated at all (p<0.001). Twin-bearing hoggets were heavier than both their single-bearing and non-pregnant counterparts (p<0.001). A greater proportion of the teased hoggets were mated in the first 17 days only compared with unteased hoggets (62.6 vs 32.1%; p<0.001). In contrast, more of the unteased hoggets were marked in the second 17-day period only (p<0.001). A greater proportion of mated, unteased hoggets were found to be non-

pregnant in comparison to their teased counterparts (17.8 vs 11.2%; $p=0.02$). CONCLUSIONS: Heavier hoggets at breeding were more likely to be mated in the first 17 days of the breeding period and more likely to be twin-bearing. Use of teaser rams for 17 days prior to the breeding period increased the proportion of hoggets mated in the first 17 days, increased conception rates, and thus increased the proportion of pregnant hoggets. These results indicate that farmers should utilise teasers for 17 days prior to commencement of the breeding period and avoid mating hoggets that weigh below 36 kg.

BRUCELLA MELITENSIS

Persistencia de Brucella melitensis en ovejas infectadas experimentalmente a través de tres ciclos reproductores.

The Persistence of *Brucella melitensis* in Experimentally Infected Ewes Through Three Reproductive Cycles.

J Vet Med B Infect Dis Vet Public Health. 2005 Nov; 52(9):403-409.

Tittarelli M, Di Ventura M, De Massis F, Scacchia M, Giovannini A, Nannini D, Caporale V.

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Summary The authors studied the persistence of infection in 46 ewes experimentally infected with *Brucella melitensis* biovar 3 and monitored through three subsequent reproductive cycles. The entire experimental period lasted for 151 weeks. Infection of ewes and elimination of *Brucella* in milk, or its presence in vaginal discharges, persisted throughout the duration of the trial, as demonstrated by recurrent elimination of *Brucella* in milk and vaginal discharges. *Brucella melitensis* was recovered from the tissues of one ewe killed at the end of the trial. The strain was recovered from vaginal swabs and milk following parturition in the third reproductive cycle from an ewe that had aborted in the first cycle but was not pregnant in the second cycle. From a public health point of view, the periodical recovery of *Brucella* from the milk during the entire trial period illustrated that brucellosis in sheep remains a continuous occupational risk and a significant public health problem for consumers of fresh milk and milk products. That risk may persist for at least 3 years following the initial infection of the flock. Lamb antibody titres became negative in all lambs within 5 months after birth. This suggested that serological tests on lambs may have no practical diagnostic significance if performed during the first 5 months of life. Nevertheless, the birth of three infected lambs suggested that the phenomenon of latent carrier state may represent another way for *B. melitensis* to persist in a flock.

CARNEROS

Las reservas corporales afectan las respuestas endócrinas reproductoras a un cambio agudo en la nutrición de carneros adultos.

Body reserves affect the reproductive endocrine responses to an acute change in nutrition in mature male sheep.

Anim Reprod Sci. 2005 Sep; 88(3-4):257-69.

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Metabolic status is a powerful regulator of reproductive activity, but the metabolic mediators involved and the relationships between fat reserves, food intake and the systems that control reproduction are not fully understood. In this study with mature male Merino sheep, we tested whether the effect of an acute nutritional stimulus on pulsatile LH secretion depended on body condition. Two groups of rams ("Fat" and "Lean") were fed differentially for 4 months to

achieve high or low levels of body mass and body condition score. Half of each group was then assigned to be fed either their maintenance requirement or twice their maintenance requirement and, 7 days later, plasma samples were collected every 20 min for 24 h. All samples were used for the analysis of LH pulses and pooled samples were used for the measurement of metabolic hormone concentrations. In the rams that were fed the maintenance diet, the frequency of LH pulses was similar for the Fat and Lean groups, but plasma concentrations of leptin and insulin were significantly higher in the Fat group than in the Lean group. Following an acute increase in food intake, plasma concentrations of insulin were significantly increased in both Fat and Lean rams, but plasma leptin concentrations were increased only in Fat rams and LH pulse frequency was increased only in Lean rams. We concluded that the secretion of LH and leptin, but not insulin, is differentially influenced by nutritional status and body condition and that the role of leptin in the central regulation of the GnRH-LH system is probably permissive.

Efecto de la raza y la edad sobre el comportamiento sexual en carneros.

Effect of breed and age on sexual behaviour of rams.

Theriogenology. 2005 Oct 11; [Epub ahead of print]

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The objective of this study was to highlight the problems that arise during the reproduction between thin-tailed rams and fat-tailed ewes. At the same time, particular emphasis laid on the influence of sheep breed, sheep age, time after ram introduction and day of the ewe estrus cycle on ram and ewe sexual behaviour. Rams were subjected to sexual performance tests by being individually exposed to 12 ewes for 3h daily, 19 consecutive days. The 16 rams of the experiment were separated according to their age (9 and 21 months old) and breed (Chios and Karagouniki), and the 96 ewes of Chios fat-tailed breed, were divided by age (9 and 21 months old). The main characteristics of courtship behaviour, like sniffing, nudging, flehmen response and following were recorded and studied in detail. Mature Chios rams, which were the only one with previous experience of Chios ewes, exhibited higher rates of sexual interest per ewe than the other rams ($P<0.05$). On the other hand, rams sniffed and nudged more young than mature ewes ($P<0.05$), probably due to the fact that young ewes did not express intense symptoms of estrus. Young rams exhibited substandard sexual interest towards mature ewes, when they first came in contact with them ($P<0.05$). In general, Karagouniki thin-tailed rams exhibited reduced rates of mating behaviour when they courted with Chios fat-tailed ewes in comparison with Chios rams ($P<0.05$). Moreover, as the time after ram introduction passed, the frequency and duration of sexual behaviour components decreased ($P<0.001$). Finally, the effect of the day of the experiment was only significant in the case of sniffing, which increased during the first 2 days and then declined and stabilized ($P<0.01$). As it was demonstrated, ram age and ram breed played a fundamental role in the exhibition of sexual interest elements.

Relaciones entre clasificaciones de comportamiento sexual de carneros y corderos engendrados, en un ambiente competitivo.

Relationship between sexual behavior classifications of rams and lambs sired in a competitive breeding environment.

J Anim Sci. 2006 Feb; 84(2):463-8.

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The objectives for this study were to 1) determine the relationship between sexual performance class and lambs sired in a competitive mating environment, and 2) determine whether the male-oriented ram test is valid. Fifteen 2- to 3-yr-old whitefaced rams classified as female-oriented, with high or low sexual performance, or classified as male-oriented were used

in a multiple-sire breeding arrangement. Five groups of approximately 200 ewes each were exposed for 21 d to 3 rams per group consisting of 1 ram from each class. Rams were blocked for sexual class, and those with close genetic relationship were assigned to different pens. Genomic DNA was prepared from blood collected from 15 rams, 934 ewes, and 1,757 lambs. Up to 4 microsatellite markers were used to determine a lamb's sire. Of 884 ewes with identifiable lambs (known sires), 178 ewes had single lambs, 408 had multiples sired by 1 ram, and 298 had multiples sired by more than 1 ram. The sexual partner preference test used to identify male-oriented rams did not absolutely reflect their sexual performance during competitive breeding. In contrast to only mounting and servicing males in preference tests before breeding, male-oriented rams sired 480 lambs from 330 ewes. Serving capacity tests predicted sexual performance of high and low sexual performance rams. High performance rams impregnated more ewes (499 vs. 258; $P < 0.05$) and sired more lambs (756 vs. 357; $P < 0.05$) than did low performance rams, respectively. Low performance and male-oriented rams did not differ for ewes impregnated or lambs sired. We conclude that 1) sexual partner preference tests used to classify male-oriented rams were not absolute in reflecting their breeding performance in a competitive breeding environment; 2) serving capacity tests predicted that high performance rams would breed more ewes than low performance rams and sire more lambs than either low performance or male-oriented rams; and 3) under the conditions of this study, low performance and male-oriented rams did not have an adverse impact on the overall breeding outcome. Combined, low performance and male-oriented rams sired 81 more lambs than did high performance rams, but this required twice as many rams to obtain approximately equal breeding results. Therefore, we suggest that serving capacity tests should be used to select high performance rams, reduce number of rams with marginal sexual performance, and make decisions on ram numbers needed.

Infusión intracerebroventricular de LEPTINA en carneros merino adultos de diferentes status metabólicos: efectos sobre las concentraciones sanguíneas de glucosa, las hormonas metabólicas y reproductoras.

Intracerebroventricular infusion of leptin into mature merino rams of different metabolic status: effects on blood concentrations of glucose and reproductive and metabolic hormones.

Reprod Domest Anim. 2006 Feb; 41(1):79-90.

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In mature Merino rams, nutrition is one of the external cues that most strongly affects the reproductive centres of the preoptic-hypothalamic continuum. The signalling pathways that link dietary status and the activity of the neurones that produce gonadotrophin-releasing hormone signals are thought to be partly hormonal in nature to reflect the amount of body reserves. Among the hormones thought to be involved are insulin and leptin. This study tested whether recombinant bovine leptin infused (0.4 microg/h) into the third cerebral ventricle would stimulate pulsatile luteinizing hormone (LH) secretion in mature Merino rams when their energy status was low or decreasing, during both chronic (fasting) and acute reductions of energy balance. Leptin may interact with other hormones that depend on energy availability, so we also monitored changes in circulating concentrations of insulin, thyroid hormones, growth hormone, prolactin and adrenocorticotrophin. Overall, our data do not support this hypothesis. The dietary regimes induced clear responses in the metabolic profiles of the animals but there was no clear effect of central leptin administration on LH pulse frequency. The relationships between the hormonal systems measured in the present study add weight to the contention that leptin plays only a permissive role in the nutritional control of the reproductive axis and that other hormonal

signals (particularly insulin) or pathways are acting in concert with leptin to stimulate the reproductive axis.

CELO, INDUCCIÓN

Comparación de la inducción del celo y la subsiguiente fertilidad con dos dispositivos intravaginales, en ovejas, durante la estación “no-sexual”.

Comparison of estrus induction and subsequent fertility with two different intravaginal devices in ewes during the non-breeding season.

J Reprod Dev. 2005 Sep 2; [Epub ahead of print]

Kohno H, Okamoto C, Iida K, Takeda T, Kaneko E, Kawashima C, Miyamoto A, Fukui Y.
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Two experiments were conducted to compare the effect of estrus induction by controlled internal drug release (CIDR) and intravaginal cream containing 500 mg progesterone (P cream) in ewes during the non-breeding season. In the first experiment, twenty-four ewes were randomly grouped for two treatments with the different intravaginal devices for 12 days: Group A was the CIDR group and Group B was the P cream group. Blood was collected from all treated ewes, and progesterone (P4), estradiol 17-beta (E2) and luteinizing hormone (LH) concentrations were measured by enzyme immunoassay. In the second experiment, the conception rates from natural mating, estrus-detected AI (inseminated 12 h after estrus detection), or fixed-time AI (inseminated 42 h after removal of an intravaginal device) in 127 ewes treated with CIDR or P cream were compared. In Experiment 1, the rate of estrus induction and the time of estrus onset after device removal were 91.7% and 36.3 +/- 15.7 h in Group A, and 100% and 35.0 +/- 12.6 h in Group B, respectively. There were no significant differences between the devices. The mean plasma P4 concentration in Group B was significantly (P<0.01) lower than Group A between day -9 and day -1 (Day 0: the day of device removal). However, no significant differences were found in the mean E2 concentrations of the two groups after treatment. The mean time of estrus onset in ewes with an observed LH surge and the time of LH surge after treatment were 23.3 +/- 8.7 h and 30.3 +/- 5.0 h for Group A and 27.6 +/- 6.5 and 26.3 +/- 8.0 h for Group B, respectively, and there were no significant differences. However, a significant difference (P<0.05) was found in the mean time from the time of estrus onset to LH surge between Group A (6.4 +/- 6.7 h) and Group B (-1.3 +/- 4.1 h). In Experiment 2, the conception rates for natural mating, estrus-detected AI, and fixed-time AI were 55.0, 29.4, and 25.0% for Group A and 40.7, 25.0, and 42.1% for Group B, respectively, and there were no significant differences. These results suggest that the effect of induction of estrus and ovulation and the rate of conception after treatment were comparable to CIDR even though the plasma P4 concentration of the P cream method tended to be low during the insertion period.

CICLO ESTRAL

Dinámica folicular y hormonal durante el ciclo estral en cabras.

Follicular and hormonal dynamics during the estrous cycle in goats.

J Reprod Dev. 2005 Aug; 51(4):455-63.

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Transrectal ultrasonography of ovaries was performed daily in 6 goats for 3 consecutive estrous cycles. Blood samples collected daily were measured for concentrations of FSH, inhibin A, and estradiol-17beta. Follicular and hormonal data were analyzed for associations between the follicular waves and hormonal concentrations. During the interovulatory intervals, follicular growth and regression occurred in a wave like pattern (2-5 waves), and the predominant patterns were three and four follicular waves. In addition, there was no significant difference among the

diameters of dominant follicles during the growth phase of the follicular waves. The number of 3 mm follicles peaked on days 0, 7, and 11 in interovulatory intervals that had three follicular waves and on days -1, 5, 11, and 15 in those that had four follicular waves. Plasma concentrations of FSH increased around the day of follicular wave emergence and declined with the growth of follicles. Circulating FSH increased again concomitant with regression of dominant follicles in the anovulatory wave, whereas FSH levels remained low in the ovulatory wave. Inhibin A was negatively correlated with FSH, while it was positively correlated with estradiol-17beta, suggesting that inhibin A is a product of healthy growing follicles and that it contributes to the suppression of FSH secretion. In conclusion, the growth of ovarian follicles in goats exhibits a wave-like pattern, and follicular dominance is less apparent in goats. Moreover, inhibin A may be a key hormone for regulation of the follicular wave through suppression of FSH secretion in goats.

CLONACIÓN

Amormalidades placentarias asociadas con mortalidad postnatal en clones de células (granulosas) somáticas ovinas.

Placental abnormalities associated with post-natal mortality in sheep somatic cell clones.

Theriogenology. 2005 Sep 7; [Epub ahead of print]

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We report on cloning experiments designed to explore the causes of peri- and post-natal mortality of cloned lambs. A total of 93 blastocysts obtained by nuclear transfer of somatic cells (granulosa cells) were transferred into 41 recipient ewes, and pregnancies were monitored by ultrasound scanning. In vitro derived, fertilized embryos (IVF, n=123) were also transferred to assess oocyte competence, and naturally mated ewes (n=120) were analysed as well. Cloned embryos developed to the blastocyst stage and implanted at the same rate as IVF embryos. After day 30 of gestation, however, dramatic losses occurred, and only 12 out of 93 (13%) clones reached full-term development, compared to 51 out of 123 (41.6%) lambs born from the IVF control embryos. Three full-term lamb clones were delivered stillborn, as a result of placental degeneration. A further five clone recipients developed hydroallantois. Their lambs died within 24h following delivery by caesarian section, and displayed degenerative lesions in liver and kidney resulting from the severe hydroallantois. One set of twins was delivered by assisted parturition at day 150, but died 24h later due to respiratory distress syndrome. The remaining two clone recipients underwent caesarian section, and the corresponding two lambs displayed signs of respiratory dysfunction and died at approximately 1 month of age due to a bacterial complication. Blood samples collected from the cloned lambs after birth revealed a wide range of abnormalities indicative of kidney and liver dysfunction. Macroscopical and histopathological examination of the placentae revealed a marked reduction in vascularization, particularly at the apex of the villous processes, as well as a loss of differentiation of the trophoblastic epithelium. Our results strongly suggest that post-mortality in cloned lambs is mainly caused by placental abnormalities.

EMBRIONES

Efecto de la nutrición peri-concepción sobre la calidad embrionaria, en la oveja superovulada.

The effect of peri-conception nutrition on embryo quality in the superovulated ewe.

Theriogenology. 2005 Sep 15; 64(5):1090-103. Epub 2005 Mar 19.

Kakar MA, Maddocks S, Lorimer MF, Kleemann DO, Rudiger SR, Hartwich KM, Walker SK.

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Evidence indicates that oocyte/embryo quality in the sheep is affected by nutrient status during the cycle of conception. This study aimed to determine, in the superovulated ewe, if there are stages during the peri-conception period (-18 days to +6 days relative to the day of ovulation [Day 0]) when quality is more likely to be influenced by nutrition. In Experiment 1, ewes were provided with either a 0.5 x maintenance (L), 1.0 x maintenance (M) or 1.5 x maintenance (H) diet (in terms of daily energy requirements) during the peri-conception period. Diet did not affect the mean ovulation rate (range: 15.4+/-1.47 to 16.1+/-1.55) nor the mean number of embryos collected per ewe (range: 10.9+/-2.05 to 12.4+/-1.82) but there was an increase ($P<0.05$) in the mean number of cells per blastocyst in the L diet (74.7+/-1.45) compared with either the M (66.4+/-1.29) or H (62.0+/-0.84) diets. This increase was due to an increase in the number of trophectoderm (Tr) cells, resulting in a shift ($P<0.05$) in the Tr:inner cell mass (ICM) cell ratio (range 0.69+/-0.03 to 0.73+/-0.04). In Experiment 2, six diets (HHH, MHH, MHL, MLH, MLL and LLL) were imposed during three 6-day periods commencing 12 days before and continuing until 6 days after ovulation. Although diet had minimal effect on the superovulatory response, both the mean number of cells per blastocyst and the Tr:ICM ratio were increased ($P<0.05$) when the L diet was provided after Day 0 (diets MHL, MLL and LLL). It is concluded that the ewe is able to respond to acute changes in nutrition imposed immediately after ovulation, resulting in changes in embryo development including cell lineage differentiation. The significance of these findings, in terms of fetal development, embryo-maternal signalling and the nutritional management of the ewe is discussed.

EPIDURAL

Efectos de la administración epidural preoperatoria de ketamina racémica para la analgesia en ovinos sometidos a cirugía.

Effects of preoperative epidural administration of racemic ketamine for analgesia in sheep undergoing surgery.

J Am Vet Med Assoc. 2006 Feb 15; 228(4):591.

Guedes AG, Pluhar GE, Daubs BM, Rude EP.

Objective-To investigate the effects of preoperative epidural administration of racemic ketamine to provide analgesia in sheep undergoing experimental hind limb orthopedic surgery. Animals-12 adult sheep (weight range, 51.4 to 67.2 kg). Procedure-Sheep were anesthetized with guaifenesin, thiopental, and isoflurane; after induction of anesthesia, sheep received a lumbosacral epidural injection of ketamine (1 mg/kg; n = 6) or saline (0.9% NaCl) solution (1 mL/7 kg; 6 [control group]). Respiratory and cardiovascular variables were recorded before and at intervals during and for 6 hours after anesthesia. During that 6-hour postoperative period, analgesia was evaluated subjectively with a numeric ranking scale that included assessments of comfort, posture, movement, and response to wound palpation; buprenorphine was administered when a score > 3 (maximum score, 10) was achieved. Rectal temperature, heart and respiratory rates, and lameness were evaluated daily for 2 weeks after surgery. Results-At all evaluations, cardiovascular and respiratory variables were comparable between the 2 groups. Compared with control sheep, time to first administration of rescue analgesic was significantly longer and total dose of buprenorphine administered during the 6-hour postoperative period was significantly decreased for ketamine-treated sheep. During the second week following surgery, ketamine-treated sheep had significantly less lameness than control sheep. Conclusions and Clinical Relevance-In sheep undergoing hind limb surgery, preoperative epidural administration of ketamine appears to provide analgesia in the immediate postoperative period and has residual

analgesic effects, which may contribute to more rapid return of normal function in surgically treated limbs. (Am J Vet Res 2006; 67: 222-229).

FUNCIÓN LÚTEA

Evaluación de la función lútea por ultrasonografía y medición de CL en cabras.

Assessment of luteal function by ultrasonographic appearance and measurement of corpora lutea in goats.

Anim Reprod Sci. 2006 Feb 13; [Epub ahead of print]

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In order to characterize the evolution pattern of the corpora lutea (CL) and to compare luteal function with their ultrasonographic appearance, 37 estrous cycles of Serrana goats (n=22) were studied during breeding season. A daily transrectal ultrasound scanning was performed through two successive estrous cycles. Both solid and fluid-filled CL were observed and measured in both ovaries of each goat. Additionally, each CL was classified as CL(ICHE) (CL with irregular contours and heterogeneous echotexture) or CL(RCGE) (CL with regular contours and granular echotexture). Ovarian cyclic activity and luteal function were evaluated by biweekly plasma progesterone (P4) determination. The CL (n=60) were first visualized on day 2.9+/-1.0 after the day of ovulation (day 0), showing 7.1+/-1.8mm of diameter and reach their maximum size (12.5+/-1.6mm) on day 10.7+/-3.2 (P<0.001). Two days before the following ovulation (day -2), the CL regressed to 8.4+/-1.3mm (P<0.001). The central cavity was found in 78.3% of CL, and had a persistence of over 50% until the last days of estrous cycle. The ratio CL length/cavity length was low during the first-third and high during the remaining two-thirds of estrous cycle. On day 2, the percentage of CL(ICHE) was 33.3%, and began to decrease to 16.7% on day 6, reaching the minimum of 3.3% on day 10 (P<0.001). This proportion increased on day -3 to 48.3% and reached 90% on day -1 (P<0.001). The correlation between CL size and plasma P4 levels was r=0.63 (n=87; P<0.001). A negative correlation between the daily proportion of CL(ICHE) and plasma P4 levels was found (r=-0.95; n=18; P<0.001). These results suggest that the ultrasonographic appearance of CL is a reliable parameter for the assessment of luteal function in goats. Both the characterization of echotexture and size of central cavity could be valuable tools to differentiate between phases of normal estrous cycles.

LISTERIOSIS

Brote de listeriosis clínica en ovinos: evaluación de posibles vías de contaminación.

Outbreak of clinical listeriosis in sheep: evaluation from possible contamination routes from feed to raw produce and humans.

J Vet Med B Infect Dis Vet Public Health. 2005 Aug; 52(6):278-83.

Wagner M, Melzner D, Bago Z, Winter P, Egerbacher M, Schilcher F, Zangana A, Schoder D.

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We report the results of clinical and microbiological investigations on *Listeria monocytogenes* infections in a flock of 55 sheep and describe the implications for the safety of the raw milk and raw-milk cheeses produced in the on-farm dairy. The outbreak was caused by feeding grass silage, which was contaminated with 5 log₁₀ CFU *L. monocytogenes*/g. Clinically, although having been fed from the same batch of silage, abortive (nine ewes), encephalitic (one ewe) and septicaemic (four ewes) forms of listeriosis were observed during the outbreak phase. As the starting point of feeding the contaminated silage was known we could calculate an

incubation period of 18 \pm 2 and 26 days for the abortive and the encephalitic form of listeriosis, respectively. Pathologically, the septicaemic cases suffered from *Listeria* accumulation at comparable numbers in visceral organs but not in the brain. Only a single ewe developed central nervous symptoms and a rhomb-encephalitis was immunohistologically confirmed. In this case the infection proceeded from the nasal mucosa into the brain, with no infections of the liver, spleen and other visceral organs. Sampling of the cheese production chain, the farm environment and the persons living at the farm revealed the exposure of a farm-worker to an isolate genetically indistinguishable from the outbreak clone, obviously through the consumption of faecally contaminated bovine raw milk. The cheese under processing was free of *Listeria* because, as a result of intensive consultations, the farmer ensured a proper acidification of the cheese. The epidemiological findings suggest that food safety matters should be assessed in any case where infection of food-producing animals with potential human pathogens is observed.

Combinación de herramientas diagnósticas para una rápida detección de listeriosis ovina.

A combination of diagnostic tools for rapid screening of ovine listeriosis.

Res Vet Sci. 2006 Feb 15; [Epub ahead of print]

Amagliani G, Giammarini C, Omiccioli E, Merati EG, Pezzotti G, Filippini G, Brandi G, Magnani M.

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A combined serological and PCR method for the detection of *Listeria monocytogenes* infection in symptomatic and asymptomatic ovine flocks was evaluated. Seventy-eight milk samples and 157 serum samples were analysed using a *L. monocytogenes* PCR detection kit and an anti-listeriolysin O IgG immunoassay kit. The combined use of these commercial kits allowed a rapid and effective detection of *L. monocytogenes* infection in both the early stage, before seroconversion, and in a later phase, even after antibiotic therapy.

OVULACIÓN

Cambios inducidos por el ayuno en la tasa de ovulación, la leptina plasmática, la GH, el IGF-I y las concentraciones de insulina, durante el celo en ovejas.

Fasting-induced changes in ovulation rate, plasma leptin, gonadotropins, GH, IGF-I and insulin concentrations during oestrus in ewes.

J Vet Med A Physiol Pathol Clin Med. 2006 Feb; 53(1):5-11.

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The aim of this experiment was to study the changes in the hormonal status and ovulation rate (OR) evoked by starvation during the follicular phase of the oestrous cycle in ewes. To achieve this goal, 12 female crossbreed sheep were synchronized and then half of them were fasted from the 12th to the 16th day of the oestrous cycle. On the 16th day, analysis of hormones and insulin-like growth factor-I (IGF-I) were performed in 10-min intervals. Then, on the 6th day of the following oestrous cycle, the OR in all ewes was determined by laparoscopy. Fasting reduced significantly ($P < 0.05$) the OR in ewes (1.25 \pm 0.50) in comparison with control (1.75 \pm 0.50). The drop in the OR was coincident with a significant ($P < 0.001$) decrease in the plasma concentration and pulse amplitude of leptin (0.29 \pm 0.08 ng/ml versus control 0.53 \pm 0.14 ng/ml), the plasma level of luteinizing hormone (LH) (0.19 \pm 0.06 IU/l versus 0.25 \pm 0.09 IU/l in control; $P < 0.05$) and the mean frequency of LH pulses (2.0/h versus 2.5/h in control). Fasting resulted also in a significant ($P < 0.05$) decrease in the plasma concentration and pulse amplitude of follicle stimulating hormone (FSH) in comparison with the control.

Simultaneously, a significant ($P < 0.001$) drop in the IGF-I concentration in the fasted ewes (4.78 +/- 0.91 ng/ml) was found in comparison with control (7.63 +/- 1.85 ng/ml). Also the level of insulin were significantly ($P < 0.001$) lower in the fasted (178.99 +/- 39.08 pM/l respectively) than in the control sheep (302.66 +/- 49.01 pM/l respectively). Meanwhile, a double increase in the growth hormone (GH) pulses frequency and an augmentation in its plasma concentrations as a result of starvation was found. The obtained results shows that the acute fasting exerts an inhibitory effect on the ovulation rate in ewes coincident with suppression in leptin, FSH and LH secretion and changes in signalization mediated by GH.

PARATUBERCULOSIS SUBCLÍNICA

La asociación de la paratuberculosis subclínica con la fertilidad de ovejas y cabras lecheras de Grecia varía con la parición.

The association of sub-clinical paratuberculosis with the fertility of Greek dairy ewes and goats varies with parity.

Prev Vet Med. 2006 Jan 6; [Epub ahead of print]

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Our cross-sectional study investigated the association of sub-clinical Mycobacterium avium subsp. paratuberculosis (MAP) infection with failing to produce a live offspring the season of lambing/kidding (November 2001 to January 2002) before testing (in April-May 2002), in four dairy-sheep and/or goat flocks in Greece (369 animals ≥ 1.5 -year-old). From each selected animal 10ml of blood and 10g of feces from the rectum were obtained. The harvested sera were tested for antibodies to MAP with a commercial ELISA test kit; the feces were cultured on Herrold's egg-yolk medium supplemented with mycobactin J and antibiotics. An animal was considered sub-clinically infected when found either seropositive or culture positive. The true prevalence of sub-clinically infected animals, adjusted for the sensitivity and specificity of the parallel testing, was 14% (0.1-28%) and 35.9% (9.2-62.7%) in sheep and goats, respectively. The association of fertility of sheep and goats with sub-clinical paratuberculosis was investigated in random-effects logistic models. Sub-clinically infected animals (compared to uninfected) had OR for live offspring the previous year of 5.4 for parity < 4 , OR=0.05 for parity > 6 , and a non-significant OR for the middle parity category.

PROGESTERONA EXÓGENA

Efectos sobre la duración de la gestación, la supervivencia fetal y la producción de calostro en ovejas.

Effects of exogenous progesterone on gestation length, foetal survival and colostrum yield in ewes.

Theriogenology. 2005 Sep 15; 64(5):1121-9. Epub 2005 Mar 2.

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Twin bearing mature ewes ($n=40$) were treated with exogenous progesterone (100mg daily in oil) or vehicle (oil control) from Day 143 of gestation until lambing to investigate the effects on gestation length, foetal survival and colostrum yield and composition. Compared to control ewes, progesterone treated ewes had increased ($P < 0.05$) serum progesterone concentrations (by 4.3 ng/ml) before lambing and in the first day post-partum (by 10 ng/ml). Progesterone treatment increased gestation length (150.4 +/- 0.6 days versus 147.8 +/- 0.6 days, $P < 0.05$) and colostrum yield at 1h after lambing ($P < 0.05$) but the colostrum had a lower

concentration of IgG ($P=0.02$). In the first 24h after lambing, total colostrum and IgG yields were not different between groups. Four (20%) of the progesterone treated ewes produced either one or two dead lambs, while one ewe died on day 155 without initiating the birth process. We conclude that the daily administration of 100mg progesterone resulted in extended gestation length and reduced lamb survival but did not lower colostrum yield.

SALMONELLA BRANDENBURGO

Vacunación de ovejas preñadas contra la infección con Salmonella Brandenburg.

Vaccination of pregnant ewes against infection with Salmonella Brandenburg.

N Z Vet J. 2005 Dec; 53(6):416-22.

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AIMS: To develop a challenge model for Salmonella Brandenburg infection in pregnant ewes. To compare efficacies of a live attenuated Salmonella Typhimurium mutant, a subunit preparation from a virulent S. Brandenburg isolate, and a commercial multivalent inactivated vaccine in their ability to prevent experimental S. Brandenburg infection. To assess the efficacy of the live attenuated S. Typhimurium mutant against natural S. Brandenburg infection in lambs. **METHODS:** Two-year-old ewes were immunised with either a live attenuated vaccine (eye-drop; $n=20$), a subunit vaccine ($n=20$) or an inactivated bacterin vaccine ($n=20$), both administered subcutaneously, or served as unvaccinated controls ($n=21$). Four weeks later, the sensitising regime was repeated as a booster vaccination, and the ewes were challenged 6 weeks later with a virulent S. Brandenburg isolate, approximately 6 weeks prior to lambing. The presence of clinical signs, abortion or death was noted following challenge. The presence and number of Salmonella spp in faecal samples taken throughout the trial, and in organs collected post mortem, were determined using an enrichment selection procedure, and confirmed by serology and pulsed-field gel electrophoresis (PFGE). Half of the surviving lambs were vaccinated with the live attenuated vaccine and all ($n=39$) were exposed to natural infection from contaminated pasture. **RESULTS:** There was no significant protection against mortality and abortion following vaccination with the live attenuated, subunit and inactivated vaccines following experimental challenge with S. Brandenburg. There was a significant but transient decrease in the number of ewes shedding S. Brandenburg (live attenuated, $p=0.05$; subunit, $p=0.05$; inactivated, $p=0.01$), and in the quantity of these bacteria in the sheep from the vaccinated groups ($p<0.05$) compared with controls, 6 weeks after challenge. Lambs from the challenged ewes did not shed Salmonella spp after being vaccinated with the live attenuated vaccine, in contrast to some of the controls, when grazed on pasture contaminated with S. Brandenburg. **CONCLUSIONS:** The use of live attenuated, subunit and inactivated vaccines did not significantly protect sheep against lethal experimental challenge with S. Brandenburg.

OPU en ovejas: Comparación entre distintos dispositivos para una óptima recuperación de ovocitos.

Ovum Pick-up in Sheep: a Comparison between Different Aspiration Devices for Optimal Oocyte Retrieval.

Reprod Domest Anim. 2006 Apr; 41(2):106-13.

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In vivo ovum pick-up (OPU) in sheep may be improved with a proper choice of aspiration elements (needle and tubing) and aspiration vacuum pressure. In the present study, two experiments were carried out. In Expt 1, visible follicles in ovaries of slaughtered ewes (treated separately according to their diameters: small <3 mm, medium 3-5 mm and large >5 mm) were aspirated using different combinations of the three studied factors such as aspiration

flow rate (10, 20, 30, 40 and 50 ml water/min), needle gauge (18 and 20 G) and tubing inner diameter (1, 2 or 3 mm internal diameter). In Expt 2, a study with two 18 G needles of different lengths (18 G: 82 mm; 18 GL: 600 mm) was carried out, using ovaries obtained post-mortem, and performing in vivo laparoscopic follicular aspiration on ewes. We considered good quality oocytes as those with both complete compact cumulus and a homogeneous cytoplasm. Recovery rate, proportion of good quality oocytes (good quality oocytes/100 oocytes recovered) and overall efficiency (good quality oocytes/100 follicles aspirated) were noted. In Expt 1, aspiration flow rate affect remarkable proportion of good quality oocytes (69.5%, 50.5%, 44.8%, 36.5% and 28.3% for flows from 10 to 50 ml/min respectively, $p < 0.05$). Needle gauge did not affect aspiration device efficiency. Thin and intermediate tubings were more effective (overall efficiency rates: 34.9%, 32.3% and 28.1% for 1, 2 and 3 mm respectively, $p < 0.05$). Follicle size did not affect recovery rate, but proportion of good quality oocytes was higher for large (77.9%) and medium (64.4%) follicles ($p < 0.05$). Finally, some combinations of the aspiration device showed greater effectiveness. In Expt 2, needle length did not influence recovery rate, but good quality oocytes rate was significantly modified both post-mortem and in vivo (good quality rate for 18 G vs 18 GL needles: 69.5% vs 47.7% and 58.1% vs 25.4%, post-mortem and in vivo respectively, $p < 0.05$). We conclude that low-aspiration flow rates (10 and 20 ml/min) with thin or intermediate tubings (1 and 2 mm), and any short needle (18 G or 20 G) are the most adequate aspiration factors for OPU in sheep.

PREÑEZ y LACTANCIA PROLONGADA

Efecto sobre la producción de leche en CABRAS lecheras ordeñadas una vez por día.

Effect of pregnancy and extended lactation on milk production in dairy goats milked once daily.

J Dairy Sci. 2005 Nov; 88(11):3894-904.

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Thirty multiparous Murciano-Granadina dairy goats milked once daily were used to study the lactational effects of an extended 24-mo kidding interval (K24; $n = 14$) compared with the traditional 12-mo kidding interval (K12; $n = 16$). Goats were divided into 2 groups at wk 29 of lactation balanced with respect to parity, milk yield, and somatic cell count. Over a period of 92 wk, K12 goats were mated twice, at wk 29 during the first lactation and at wk 79 during the second lactation, whereas K24 goats were mated once, at wk 79 of extended first lactation. The K12 goats were dried off from wk 14 to 21 of pregnancy (wk 43 to 50 of lactation). Milk yield was recorded from wk 2 to 92, and milk composition was studied from wk 29 to 92. Milk fatty acids were analyzed in milk samples taken at wk 39 (wk 10 of pregnancy) and 55 (wk 5 of subsequent lactation), when milk in udder compartments (cisternal and alveolar) was also evaluated. Average milk yield during the first 29 wk was 2.23 ± 0.13 L/d. Pregnancy reduced milk yield in K12 goats from wk 39 to 42 of lactation compared with K24 goats. During the dry period for K12 goats, milk yield of K24 goats averaged 1.53 ± 0.10 L/d. From wk 51 to 79, K12 goats produced 32% more milk than did K24 goats, but their milk contained lower fat and protein than that of K24 goats. No changes were detected for milk lactose and somatic cell count from wk 51 to 79. From wk 80 to 92, differences in milk yield and milk composition between groups were not significant. Milk of pregnant K12 goats contained higher C16:1 and conjugated C18:2 fatty acids, and had a higher desaturase index than milk of open K24 goats at wk 39. In the following lactation (wk 55), milk of K12 goats contained higher C18:2 and C18:3, and lower C16:0 fatty acids, resulting in a lower atherogenicity index compared with K24 goats. Cisternal milk at wk 39 was lower for K12 than K24 goats, whereas alveolar milk did not differ. In K12 goats, values of cisternal milk tripled, but alveolar milk only doubled at wk 55 (wk 5 of subsequent lactation) compared with wk 39, indicating the importance of the cistern in

accommodating high milk yield in early lactation. Values of cisternal and alveolar milk did not differ between wk 39 and 55 for K24 goats. Fat content was higher for alveolar milk than cisternal milk for K12 goats at wk 55 and for K24 goats at wk 39 and 55. No differences in milk protein or lactose were detected between cisternal and alveolar milk. In conclusion, pregnancy reduced milk yield from wk 10 after conceiving onwards. Extended lactation did not significantly decrease milk yield (-8.2%), but increased milk components that may contribute to cheese yield, and may be a useful strategy for reducing metabolic stress in early lactation and for simplifying herd management in dairy goats.

PREÑEZ MÚLTIPLE y SIMPLE en OVEJAS.

Comparación de la exactitud de la ultrasonografía transabdominal, con los tests de progesterona y de glucoproteínas asociadas a la preñez para la discriminación entre preñez múltiple y simple en ovejas.

Comparison of accuracy of transabdominal ultrasonography, progesterone and pregnancy-associated glycoproteins tests for discrimination between single and multiple pregnancy in sheep.

Theriogenology. 2005 Dec 30; [Epub ahead of print]

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The aim of the present study was to evaluate and, compare the accuracy of transabdominal ultrasonographic (US) and the progesterone (P4-RIA) and ovine pregnancy-associated glycoprotein (ovPAG-RIA) tests for the discrimination between single and multiple pregnancy in sheep. One hundred pregnant AwassixMerino ewes were scanned by transabdominal ultrasonography (3.5MHz linear-array transducer) at Days 43-56 and 81 of these ewes were scanned at Days 76-87 of gestation. The ewes were scanned in dorsal recumbency at the bare area of the inguinal regions (without pre-scanning shaving of the ventral abdominal wall). After each scan, blood samples were withdrawn from the jugular vein to estimate the levels of P4 and ovPAG by radioimmunoassay. At lambing, 61 ewes gave birth to single lambs and 39 ewes gave birth to multiples. The sensitivity of the transabdominal US, the P4-RIA and the ovPAG-RIA tests for determining ewes carrying multiples was 54, 64.1 and 64.1% at Days 43-56. At Days 76-87 of gestation these accuracies were 60.0, 66.7 and 76.6% for the US, P4-RIA and PAG-RIA tests, respectively. The specificity of the transabdominal US, the P4-RIA and the ovPAG-RIA tests for determining ewes carrying singles, was 78.6, 60.7 and 62.3% at Days 43-56 and 78.4, 64.7 and 70.6% at Days 76-87 of gestation, respectively. It is concluded that the accuracy of transabdominal ultrasonographic (without pre-scanning shaving of the ventral abdominal wall), the P4- and the ovPAG-RIA tests for determination of the fetal numbers in AwassixMerino crossbred ewes is too low to be used in the field.

PROSTAGLANDINA F2 ALFA

¿Puede la inyección de prostaglandina F2 alfa causar ovulación en ovejas Cara Blanca del Oeste en anestro?

Does injection of prostaglandin F(2alpha) (PGF(2alpha)) cause ovulation in anestrus Western White Face ewes?

Theriogenology. 2005 Dec 3; [Epub ahead of print]

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In a previous study in our laboratory, treatment of non-prolific Western White Face (WWF) ewes with PGF(2alpha) and intravaginal sponges containing medroxyprogesterone acetate (MAP) on approximately Day 8 of a cycle (Day 0=first ovulation of the interovulatory interval) resulted in ovulations during the subsequent 6 days when MAP sponges were in place. Two experiments were performed on WWF ewes during anestrus to allow us to independently examine if such ovulations were due to the direct effects of PGF(2alpha) on the ovary or to the effects of a rapid decrease in serum concentrations of progesterone at PGF(2alpha)-induced luteolysis. Experiment 1: ewes fitted with MAP sponges for 6 days (n=12) were injected with PGF(2alpha) (n=6; 15mg im), or saline (n=6) on the day of sponge insertion. Experiment 2: ewes received progesterone-releasing subcutaneous implants (n=6) or empty implants (n=5) for 5 days. Six hours prior to implant removal, all ewes received a MAP sponge, which remained in place for 6 days. Ewes from both experiments underwent ovarian ultrasonography and blood sampling once daily for 6 days before and twice daily for 6 days after sponge insertion. Additional blood samples were collected every 4h during sponge treatment. Experiment 1: 4-6 (67%) PGF(2alpha)-treated ewes ovulated approximately 1.5 days after PGF(2alpha) injection; these ovulations were not preceded by estrus or a preovulatory surge release of LH, and resulted in transient corpora hemorrhagica (CH). The growth phase was longer (P<0.05) and the growth rate slower (P<0.05) in ovulating versus non-ovulating follicles in PGF(2alpha)-treated ewes. Experiment 2: in ewes given progesterone implants, serum progesterone concentrations reached a peak (1.72ng/mL; P<0.001) on the day of implant removal and decreased to basal concentrations (<0.17ng/mL; P<0.001) within 24h of implant removal. No ovulations occurred in either the treated or the control ewes. We concluded that ovulations occurring after PGF(2alpha) injection, in the presence of a MAP sponge, could be due to a direct effect of PGF(2alpha) at the ovarian level, rather than a sudden decline in circulating progesterone concentrations.

SELENIO INORGÁNICO

Tolerancia al selenio inorgánico, de ovejas seleccionadas por tipo, durante la gestación y la lactación.

Tolerance of inorganic selenium by range-type ewes during gestation and lactation.

J Anim Sci. 2006 Mar; 84(3):660-8.

Davis PA, McDowell LR, Wilkinson NS, Buergelt CD, Van Alstyne R, Weldon RN, Marshall TT.

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The objectives of this 72-wk study were to evaluate and compare the effects of 6 dietary levels of inorganic Se on serum, whole blood, wool, and tissue Se concentrations and to determine the maximum tolerable level of Se for mature ewes during lamb production. Forty-one, 4-yr-old, range-type ewes (57.4 +/- 5.7 kg) were used in a completely randomized design with 6 dietary treatments. Sodium selenite was added to a corn and soybean meal-based diet to provide 0.2 (control), 4, 8, 12, 16, or 20 mg of dietary Se/kg to ewes during lamb production. Serum Se and ewe BW were measured at 4-wk intervals; whole blood Se and wool Se were measured every 12 wk; and samples of brain, diaphragm, heart, hoof, kidney, liver, and psoas major were collected at the termination of the experiment. Dietary Se did not affect ewe BW during the study (P = 0.69), and there was no treatment x time interaction. Serum Se increased linearly as dietary Se level increased (P < 0.001) and responded cubically (P = 0.02) over time. Selenium in whole blood increased linearly (P < 0.001) as supplemental Se increased. Wool Se increased linearly (P < 0.001) as dietary Se increased, and the response over time was quadratic (P < 0.001). Brain, diaphragm, heart, and psoas major Se increased (P < 0.05) linearly as dietary Se increased, liver Se responded quadratically (P < 0.05), and hoof and kidney Se increased cubically (P < 0.05) as supplemental Se increased. In general, serum, whole blood, and tissue

Se concentrations of ewes receiving 12, 16, or 20 mg of dietary Se/kg were greater ($P < 0.05$) than those of controls and ewes receiving less dietary Se. Although they were elevated in ewes receiving increased dietary Se, at no time did serum, whole blood, or wool Se concentrations reach levels previously reported as toxic, nor were clinical signs of Se toxicosis observed. Histopathological evaluation of liver, kidney, diaphragm, heart, and psoas major did not reveal evidence of Se toxicosis in ewes at any dietary Se level. Ewes under our experimental conditions and during the stresses of production were able to tolerate up to 20 mg of dietary Se/kg as sodium selenite for 72 wk. These findings suggest that the maximum tolerable level of inorganic Se for sheep is much greater than 2 mg/kg as was suggested previously. Experiments of longer duration and utilizing greater dietary Se concentrations are necessary to clearly define the maximum tolerable level.

SINCRONIZACIÓN de CELOS

Performance reproductora de ovejás después de un tratamiento de 5 días con dispositivos intravaginales con progesterona, en combinación con inyecciones de Prostaglandina F2alpha. Reproductive performance of ewes after 5-day treatment with intravaginal inserts containing progesterone in combination with injection of prostaglandin F2alpha.

Reprod Domest Anim. 2006 Apr; 41(2):142-8.

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Three experiments were conducted with a total of 1579 ewes to examine reproductive performance in response to synchronization of oestrus during the breeding season, using controlled internal drug releasing (CIDR-G) inserts in regimens designed to provide high concentrations of circulating progesterone. In experiment 1, treatment with two CIDR-G inserts for 12 days produced conception rate (79%) and prolificacy (1.9) to first service equivalent to breeding at natural oestrus (56% and 2.0, respectively). Pregnancy rates to two service periods were 90 and 79%, respectively. In experiments 2 and 3, progesterone was delivered by a single CIDR-G insert for 5 days in combination with prostaglandin F(2)alpha (PGF(2)alpha; 5 mg i.m., twice, 3 h apart) the day before (experiment 2), or at insert removal (experiment 3). The combined treatments improved rates of synchronization of oestrus ($p < 0.01$) by 23 and 20% points, respectively, and pregnancy rates to the first service period by 19 ($p < 0.05$) and 13 ($p < 0.01$) percentage points, respectively, compared to treatment with PGF(2)alpha alone. It is concluded that the combination of treatment for 5 days with a CIDR-G insert and two injections of 5 mg PGF(2)alpha, the day before, or the day of insert removal, were effective treatments to obtain high fertility at synchronized oestrus in ewes during the breeding season.

TOXEMIA DE PREÑEZ

La preñez dificulta la eliminación de cuerpos cetónicos en la gestación avanzada de ovejás: Implicaciones para el comienzo de la toxemia de preñez.

Pregnancy impairs ketone body disposal in late gestating ewes: Implications for onset of pregnancy toxemia.

Res Vet Sci. 2006 Jan 18; [Epub ahead of print]

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The impact of pregnancy on ketone body disposal during a hyperketonaemic clamp was examined by tracer isotope dilution techniques in seven 12h fasted sheep in three reproductive

states, in the dry non-gestating period, late in gestation and during early lactation. After a sampling period of 60min under basal conditions a DL-BHB racemate solution was continuously infused intravenously for 3h at rates of 14.3-24.3mmol/(kgmin) to elevate the D-BHB concentration in blood plasma to values between 5 and 7mmol/l. Two separate experiments were carried out with the same sheep in each of the three reproductive states. During pregnancy three ewes were pregnant with a single lamb and four ewes carried twins. Maximal D-BHB turnover rates fell significantly in late gestation by 26% relative to early lactation and by 22% when compared with the dry non-pregnant state. Reduction of maximal D-BHB disposal rate during late gestation was accompanied by a significant 297% ($p<0.005$) and a non-significant 49% increase in the basal BHB concentration in blood, a non-significant 10% and 4% decrease in the rate constant of D-BHB turnover and a non-significant 24% and 13% rise in the incremented increase of D-BHB concentration per unit D-BHB infusion, relative to the dry and the lactating period, respectively. Induction of hyperketonaemia significantly lowered NEFA and glycerol concentrations in blood by 67% and 57%, respectively, compared to the pre-infusional concentrations. The magnitude of this effect was the same in all reproductive states and was explained as a direct antilipolytic action of D-BHB on adipose tissue. It is concluded that the reduced ability of the late gestating ewe to utilize D-BHB promotes hyperketonaemia. Since hyperketonaemia exerts several adverse effects, e.g. on energy balance and glucose metabolism it appears that the impairment of ketone bodies disposal in late pregnancy facilitates development of pregnancy toxemia, especially in ewes carrying twins.

TUMOR OVÁRICO

Desarrollo mamario, lactación y ascitis en una oveja con un tumor ovárico de las células granulosas.

Udder development, lactation and ascites in a ewe with an ovarian granulosa cell tumour.

Aust Vet J. 2005 Aug; 83(8):486-8.

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A 20-month-old sexually intact female mixed breed sheep was examined for lameness, unexpected udder development, lactation and anorexia. Tachycardia, tachypnoea, severe abdominal distension and vaginal prolapse were evident upon physical examination. A right hindlimb lameness was present at the walk. The udder was well-developed and milk, normal in appearance, was easily expressed from each teat. Ultrasonographic evaluation revealed a non-pregnant uterus, severe ascites and a large (12 cm diameter) abdominal mass. Although surgical treatment was discussed, the owners elected to euthanase the ewe. Necropsy examination confirmed the presence of severe ascites due to a ruptured ovarian tumour. The tumour was diagnosed as a granulosa cell tumour histologically. Unexpected udder development and lactation presumably occurred secondary to oestrogen and progesterone production by the tumour. To the authors' knowledge, this is the first report of udder development, lactation and ascites in a ewe secondary to an ovarian granulosa cell tumour.

ÚTERO OVINO

Identificación de genes endometriales regulados por la preñez temprana, la progesterona, y el interferón tau en el útero ovino.

Identification of endometrial genes regulated by early pregnancy, progesterone, and interferon tau in the ovine uterus.

Biol Reprod. 2006 Feb; 74(2):383-94. Epub 2005 Oct 26.

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During early pregnancy in ruminants, progesterone (progesterona) from the corpus luteum and interferon tau (IFNT) from the conceptus act on the endometrium to regulate genes important for uterine receptivity and conceptus growth. The use of the uterine gland knockout (UGKO) ewe has demonstrated the critical role of epithelial secretions in regulation of conceptus survival and growth. A custom ovine cDNA array was used to identify alterations in gene expression of endometria from Day 14 cyclic, pregnant, and UGKO ewes (study 1) and from cyclic ewes treated with progesterona or progesterona with ZK 136,317 antiprogestin and control proteins or IFNT (study 2). In study 1, expression of 47 genes was more than 2-fold different between Day 14 pregnant and cyclic endometria, whereas 23 genes was different between Day 14 cyclic and UGKO endometria. In study 2, 70 genes were different due to progesterona alone, 74 genes were affected by IFNT in a progesterona-dependent manner, and 180 genes were regulated by IFNT in a progesterona-independent manner. In each study, an approximately equal number of genes were found to be activated or repressed in each group. Endometrial genes increased by pregnancy and progesterona and/or IFNT include B2M, CTSL, CXCL10, G1P3, GRP, IFI27, IFIT1, IFITM3, LGALS15, MX1, POSTN, RSAD2, and STAT5A. Transcripts decreased by pregnancy and progesterona and/or IFNT include COL3A1, LUM, PTMA, PUM1, RPL9, SPARC, and VIM. Identification and analysis of these hormonally responsive genes will help define endometrial pathways critical for uterine support of peri-implantation conceptus survival, growth, and implantation.
