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Short communication

Impact of wool stubble depth after mid pregnancy shearing on Corriedale ewe and lamb performance

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ABSTRACT

The three experiments investigated the effects on physiology and production parameters of Corriedale ewes shorn in mid pregnancy, either using the cover or "R13" combs or leaving them unshorn. The experiments utilised both ewes and hoggets. In both experiments, the R13 comb left a greater stubble depth than the cover comb ($P < 0.05$). The rectal post shearing temperature of ewes shorn either by the traditional cover or by R13 comb was lower than that of unshorn ewes ($P < 0.05$), but between combs did not differ from each other ($P > 0.05$). Shearing treatment had no effect on ewe live weight ($P > 0.05$) and only a transitory ($P < 0.05$) effect on ewe body condition score was observed on some occasions. In general, mid-pregnancy shearing increased lamb birth weight ($P < 0.05$). In one out of three experiments, birth weight was increased by the R13 compared to the cover comb ($P > 0.05$). Therefore, under the extensive grazing situations of Uruguay, shearing Corriedale ewes in mid-pregnancy, is a management tool that does not increase lamb birth weight and weaning weight consistently.

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1. Introduction

Lamb mortality from birth to weaning has major economic and animal welfare impact on sheep farming worldwide. Shearing mature ewes during pregnancy has been shown to enhance lamb live weight at birth and at weaning as well as lamb survival in pastoral systems (Morris and McCutcheon, 1997; Kenyon et al., 2003; Cam and Kuran, 2004; Corner et al., 2006; Banchero et al., 2010; Sphor et al., 2011). The survival response is primarily driven by increasing lamb birth weight, however, other factors such as lamb vigour, thermoregulatory capability and dam milk yield also contribute to the enhanced lamb survival (Kenyon et al., 2003; Cam and Kuran, 2004; Banchero et al., 2010; Sphor et al., 2011). The positive lamb birth weight response to pregnancy shearing appears to be most consistent when ewes are shorn in the mid-pregnancy period particularly in multiple born lambs (Kenyon et al., 2003). However, a positive response has also been reported in singleton lambs born from Romney ewe lambs (Kenyon et al., 2006b).

In many farming systems, ewe shearing during mid-pregnancy coincides with the winter period, which increases the risk of ewe illness or death due to hypothermia (Gregory, 1995). Different types of shearing combs (cover and standard), that leave different wool stubble depth (5–9 mm vs. 3–4 mm) have been designed to reduce the risk of ewe deaths associated with extreme decreases in body temperature (Dabiri et al., 1995a; Husain et al., 1997; Morris and McCutcheon, 1997; Morris et al., 2000). Morris and McCutcheon (1997) and Morris et al. (2000) reported no difference in birth weight between lambs born to ewes shorn with either the standard or cover combs, where shearing increased lamb birth weight compared to

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unshorn ewes. However, Dabiri et al. (1995b) reported no effect of shearing comb on lamb birth weight when ewes were shorn with either the standard or cover combs. In Uruguay, there are at least three different types of shearing combs available to farmers. These include the low or standard combs, the cover comb and the "R13" comb. The R13 comb has been reported to leave a stubble length of 10 mm (Pesce, 2000). However, there are no data comparing the effects of cover and R13 combs on animal responses in ewes and their lambs. Therefore, the objectives of the present experiments were to compare the impact of mid-pregnancy shearing using two different types of combs (cover vs. R13) on the physiology and productive responses of Corriedale ewes and hoggets and of their offsprings.

2. Materials and methods

Three similar experiments were undertaken at the Glencoe Research Unit (INIA Tacuarembó Research Station) located in the central-north locations of Uruguay (latitude 32°01′32″S, longitude 57°00′39″O, and 124 m altitude), over consecutive years (2002–2004). Broadly the study involved the comparisons of different shearing methods on live weight, physiology, and survival response in lambs born to Corriedale ewes. The shearing treatments imposed were: (i) cover comb (manufactured by Sunbeam Corporation Ltd.), (ii) R13 comb (manufactured by Uruguayan Wool Secretariat) or (iii) ewes left unshorn. All studies involved the use of both mature Corriedale ewes (ranged from 2.5 to 7.5 years old) and ewe lambs (hoggets), which were naturally mated by Corriedale rams. All ewes had been pregnancy diagnosed via ultrasound technique at least 45 days after taking the rams out of the flock. Only singleton bearing ewe hoggets were used for the purpose of the present studies, while in the case of the mature ewes, singleton and twin bearing ewes were included. During the 3 years of experimentation, the shearing occurred in averaged on the 67 ± 9, 79 ± 13 and 74 ± 10 days of gestation of the ewes for the first, second and third year, respectively. After shearing until the beginning of lambing, ewes grazed native pasture using continuous grazing method. Ewes were weighed (unfasted) in late pregnancy and at weaning. Ewes were body condition scored in late pregnancy (range from 1 to 5, including half units, Russel et al., 1969). At lambing, the date of birth and dam identification was recorded for each lamb. Lambs were weighed and their sex determined. Lambs were then reweighed at weaning (at average age of approximately 90 days). The date of lamb death was also recorded to evaluate the survival rates for two periods: (a) within 72 h of birth and (b) at weaning. During the lambing period to 1 month after the end of the lambing period, the ewes and lambs were checked twice daily (morning and afternoon).

2.1. Experiment 1 – 2002

Eighty six ewe lambs (hoggets, mean weight of 36.8 ± 3.8 kg and mean condition score of 3.3 ± 0.5 units) and one hundred fifty six mature ewes (mean weight of 42.3 ± 4.6 kg and mean condition score of 3.3 ± 0.5 units) were blocked by age and the number of foetuses carried (only in mature ewes; singleton vs. twin bearing) and allocated to one of three shearing treatments either: (i) shorn with cover comb (19 singleton bearing ewe hoggets, 23 singleton bearing mature ewes and 6 twin bearing mature ewes), (ii) shorn with R13 comb (21 singleton bearing ewe hoggets, 32 singleton bearing mature ewes and 4 twin bearing mature ewes) in mid-pregnancy (D85, 85 days after the start of the 42 days breeding period) or (iii) left unshorn (46 singleton bearing ewe hoggets, 70 singleton bearing mature ewes and 21 twin bearing mature ewes). The exact timing of the major events during the study were: (a) April 4th, start of breeding (Day one, D1), (b) D85, shearing treatment, (c) D146, start of lambing, and (d) D287, weaning.

2.2. Experiment 2 – 2003

One hundred ninety three mature ewes (mean live weight of 44.3 ± 4.8 kg and mean condition score of 3.2 ± 0.4 units) were blocked by age and the number of foetuses carried (singleton vs. twin bearing) and allocated to one of three shearing treatments either: (i) shorn with the cover comb (26 singleton bearing mature ewes and 7 twin bearing mature ewes), (ii) shorn with R13 comb (29 singleton mature bearing ewes and 7 twin bearing mature ewes) in mid-pregnancy (D94, 94 days after the start of the 56 days breeding period) or (iii) left unshorn (109 singleton bearing mature ewes and 15 twin bearing mature ewes). Eighty eight ewe hoggets (mean weight of 41.1 ± 3.4 kg and mean condition score of 3.3 ± 0.3 units) were either shorn with the cover comb (n = 41) or the R13 comb (n = 47). The exact timing of the major events during the study were: (a) April 9th, start of breeding (Day one, D1), (b) D94, shearing treatment, (c) D145, start of lambing, and (d) D288, weaning.

2.3. Experiment 3 – 2004

Two hundred sixty seven mature ewes (mean weight of 44.4 ± 4.7 kg and mean condition score of 3.5 ± 0.5 units) were blocked by number of foetuses carried (singleton vs. twin bearing) and allocated to one of two shearing treatments either: (i) shorn with the cover comb (121 singleton bearing mature ewes and 25 twin bearing mature ewes) or (ii) shorn with the R13 comb (108 singleton bearing mature ewes and 13 twin bearing mature ewes) in mid-pregnancy (D91, 91 days after the start of the 45 days breeding period). Thirty ewe hoggets (mean weight of 38.5 ± 4.0 kg and mean condition score of 3.8 ± 0.3 units) were either shorn with the cover comb (n = 15) or the R13 comb (n = 15). The exact timing of the major events during the study were: (a) March 31st, start of breeding (Day one, D1), (b) D91, shearing treatment, (c) D147, start of lambing, and (d) D289, weaning.

2.4. Shearing time, rectal temperature and wool stubble depth

The time taken to shear 452 ewes was recorded (144 ewe hoggets and 308 mature ewes). In 2002, 72 ewes (13 ewe hoggets and 59 mature ewes) were shorn with cover comb and 77 (13 ewe hoggets and 64 mature ewes) with R13 comb. In 2003, 146 ewes (57 ewe hoggets and 89 mature ewes) were shorn with cover comb and 157 (61 hoggets and 96 mature ewes) with R13 comb.

The depth of the wool stubble left post shearing in 378 ewes (134 ewe hoggets and 244 mature, which included 76 and 302 ewes in 2002 and 2003, respectively) shorn with either cover (n = 183) or R13 comb (n = 195) was measured on four locations. These sites included the shoulder, ribs and forelimb and back.

Post shearing, ewe rectal temperatures were recorded at weekly intervals for 4 weeks in 225 mature ewes (94 ewes in 2002 and 131 in 2003), shorn either by cover (n = 79) or by R13 comb (n = 70) or left unshorn (n = 76). Four shearers with previous experience did the shearing using both combs. Each shearer sheared the same number of ewes with each type of comb and rotated combs and positions along the 4 shears of the shearing machine during the day.

2.5. Statistical analysis

The ewe live weight, condition score, rectal temperature and wool stubble depth and lamb live weight data were analysed within year using a complete randomised design (PROC GLM; SAS Institute Inc., Cary, USA), with the fixed effects of ewe shearing treatment, ewe age and number of lambs born (or birth rank for lamb parameters). Categorical data (lamb survival) was analysed using the CATMOD procedure of SAS (SAS Institute, 1989). For the analysis of lamb live weight at weaning the model used lamb birth weight as a covariate.

3. Results

3.1. Effect of shearing comb type on the time taken to shear, wool stubble depth and rectal temperature recorded post shearing

It took longer to shear the ewes with the R13 comb than with the cover comb (P < 0.05; 4 min and 4 s vs. 2 min and 59 s, respectively). For all the locations measured, the depth of the stubble was greater (P < 0.05) in those ewes shorn with the R13 comb than with the cover

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