The percentage of ewes that died was similar up to age 6 but increased thereafter ($P < 0.05$). The incidences of culling for mastitis/udder issues and poor body condition increased substantially after 7 years of age. As ewes aged the percentage culled for teeth (mouth) and lameness increased. Only 2.6% were culled for uterine prolapse (all prior to age 6). There was evidence for an effect of ewe genotype on the reason for culling: teeth accounted for a greater proportion of the culls of Belclare ewes compared with >75%S ewes ($P < 0.10$) while poor condition accounted for a significantly greater share of the disposals of >75%S ewes compared with Belclare ($P < 0.05$). There was no evidence for any difference between the disposal patterns when B $\times$ S was contrasted with the average of Belclare and >75%S ewes (i.e., heterosis). Age at first joining had no effect ($P > 0.05$) on output per ewe, age at culling or culling reason.

Conclusion

Mastitis/udder was the most prevalent reason for flock exit, followed by teeth, death and poor body condition. As age increased, more ewes were culled for teeth, condition and feet issues. Effects of genotype on reasons for culling were relatively minor and there was no evidence for any effect of age at first joining.

References

Hanrahan, J.P. 1989. Proceedings of the 40th European Association for Animal Production, Dublin, Ireland, 27–31.
Hanrahan, J.P., 2001. End of Project Reports: Sheep Series No. 13; Teagasc, Sheep Research Centre: Galway, Ireland, 2001; ISBN 1-84170-197-1.
Keady, T.W.J., Hanrahan, J.P., 2018. Animal 12, 722–732.
Keady, T.W.J., Hanrahan, J.P., Hession, D.V., Moran, B., Kendall, N.R., Hanrahan, K., 2019. Adv. Anim. Biosci. 10, 22.
Keady, T.W.J., 2014. Proceedings of the National Sheep Conference, Teagasc, February, pp. 18–27

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61. Effect of supplementing calcium peroxide on performance and methane emissions in dry ewes

O. Cristobal-Carballo [a,*], G. Pugh [a,b], S. Huws [b], X. Chen [a], C. Creevey [b], T. Yan [a]

[a] Agri-Food and Biosciences Institute, Hillsborough, United Kingdom
[b] Queen's University of Belfast, Belfast, United Kingdom

Presenting author.
Omar Cristobal-Carballo. omarcristobal.carballo@afbini.gov.uk

Application

Calcium peroxide can be added to the diet of ewes to reduce methane production and intensity without affecting feed intake.

Introduction

Methane production by livestock has been of major interest due to its significant contribution to anthropogenic GHG emissions and energy loss to the animal. Over the last decade, a variety of dietary manipulation approaches have been proposed to reduce enteric methane emissions in ruminants with limited success mainly due to the requirement of continuous feeding and therefore costs, negative effects on animal production on pasture based systems. Therefore, if feed additives are to become part of a successful abatement strategy for national agricultural systems, it is essential that they are shown to be effective on pasture-based systems. The curent study examined the effect of supplementing calcium peroxide, a novel methane inhibitor, in the diet to reduce methane emissions from enteric fermentation using dry ewes.

Materials and methods

Sixty Lowland crossed ewes were assigned into a continuous design study for 112 days to assess the effects of feeding calcium peroxide on animal performance and methane emissions. Three groups of ewes (20 ewes/group) were formed and balanced by age, body wight (BW) and body condition score (BCS). The additive was added to the concentrate pellets (dry matter (DM) basis) as follows: control (0.0%), medium (5.0%) and high (7.5%). Limestone was used to balance mineral concentrations in the 3 concentrate pellets. Grass silage was fed libitum, whilst the amount of concentrate was periodically adjusted (20% DM basis). DM intake (DMI) was recorded daily, whilst BW and BCS were recorded weekly. Enteric methane emissions were measured using a GreenFeed unit. Response variables were analysed using REML, with treatment as a fix effect and ewe as random effect (GenStat 21st ed., VSNI Ltd).

Table 1
Performance and methane emissions of dry ewes supplemented with calcium peroxide in the concentrate diet.

	Control	Medium	High	SED	P-Val
Initial body weight (BW; kg)	82.8	81.3	80.9	1.04	0.837
Initial body condition score (BCS)	3.33	3.28	3.07	0.193	0.361
Dry matter intake (DMI; kg/d)	1.99	2.04	1.97	0.066	0.562
Silage DMI (kg/d)	1.59	1.63	1.56	0.065	0.564
Meal DMI (kg/d)	0.40	0.41	0.41	0.004	0.252
Average daily gain (kg/d)	0.148^{a}	0.176^{b}	0.183^{b}	0.0119	0.011
Body condition score	3.75	3.78	3.84	0.161	0.879
Methane before experiment (g/d)	48.8	48.1	50.2	1.06	0.775
Methane (g/d)	48.2^{b}	47.0^{ab}	42.9^{a}	1.05	0.040
Methane yield (g/kg DMI)	24.4	23.4	22.2	1.08	0.126
Methane intensity (g/kg BWG)	331.1^{c}	272.9^{b}	239.9^{a}	19.05	<0.001

BWG=Body weight gain.

Results

Ewes supplemented with medium or high doses of calcium peroxide showed 16% or 19% greater ($P = 0.011$) average daily gains (ADG) than those in the control diet. The DMI ($P = 0.562$) and BCS ($P = 0.879$) did not differ between groups. Methane production was 11% lower ($P = 0.040$) in ewes consuming the high additive diet when compared to control ewes. Methane intensity was 17.6% and 27.5% lower ($P < 0.001$) in ewes consuming diets with medium and high additive content than in ewes receiving the control diet. Methane yield did not differ ($P = 0.126$) between treatments (See Table 1).

Conclusions

The inclusion of the calcium peroxide at ∼1.7% (high dose) of the total diet did not affect feed intake, whilst increased ADG and reduced methane production and intensity in dry ewes.

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62. Estimation of standard reference weight of ewes from the Icelandic sheep breed

J. Sveinbjörnsson

Agricultural University Of Iceland, Reykjavík, Iceland

Presenting author.

Jóhannes Sveinbjörnsson. jois@lbhi.is

Application

Estimation of standard reference weight of ewes from the Icelandic sheep breed to provide a better basis for determining nutrient requirements and improved sheep production system

Introduction

Standard Reference Weight (SRW) is a concept that connects frame size, live weight and body condition; and for any particular breed and sex of cattle or sheep SRW is the approximate liveweight achieved by that animal when skeletal development is complete and the empty body contains 250 g fat/kg (CSIRO, 1990); corresponding to body condition score 3 for sheep on the scale described by Russel et al. (1969). The SRW is a useful concept for several purposes: 1) to relate live weight and body condition for mature animals; 2) to define the maturity of growing animals; 3) with the animals estimated degree of maturity, its energy and protein requirements for growth can be estimated with much higher accuracy due to more accurate estimate of the fat, protein and energy content of the gain. To estimate SRW for ewes of the Icelandic breed of sheep, we used data on ewe live-weight (LW) and body condition scores (BCS) from 22 production years, 2001–2022, from the Hestur sheep experimental farm in Borgarfjörður, Southwest- Iceland.

Material and methods

Live weight (LW) and body condition scores (BCS) were registered at six stages of the annual cycle, defined as following: Post-weaning (18 October); Pre-mating (1 December); Post-mating (4 January); 2-months pregnant (10 February); Mid-pregnancy (15 March); Late-pregnancy (20 April). Each of the set dates varied 1–2 days in either direction. The total dataset contained around 14.000 records of LW and BCS at each stage of the annual cycle. Based on literature studies and a preliminary analysis of the data, it was decided to use for further analysis only data for ewes that had complete records of LW and BCS up to 5 years of age. According to these criteria, data for 1266 ewes were available. Ewe LW at different stages of pregnancy was corrected by formulas describing the weights of the products of conception (Robinson et al., 1976), considering the number of foetuses carried by each ewe and the stage of pregnancy based on recordings of date of mating or lamb birth. The pregnancy-free live weights (PFLW) were then regressed on BCS for data from different ewe age and stages of the annual cycle as reported in Table 1.

Table 1

Coefficients for the regressions a+b · BCS within each year and stage of the production cycle.

Production stage	year no	age mo	a	b	R^2	LW at BCS 3.00
Post-weaning	2	17	28.1^{a}	8.93^{B}	0.41	54.91
Pre-mating	2	19	31.7^{ab}	8.33^{B}	0.35	56.65
Post-mating	2	20	30.4^{ab}	8.62^{B}	0.36	56.26
2-months pregnant	2	21	32.9^{b}	8.27^{B}	0.35	57.72
Mid-pregnancy	2	22	29.6^{ab}	9.18^{B}	0.37	57.09
Late-pregnancy	2	23	34.3^{b}	8.47^{B}	0.30	59.68
Post-weaning	3	29	42.6^{c}	6.46^{A}	0.23	61.98
Pre-mating	3	31	42.9^{cd}	7.09^{AB}	0.22	64.21
Post-mating	3	32	43.2^{cd}	7.12^{AB}	0.21	64.59