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## **Reproductive performance of ewes following pre-mating targeted selective treatment against gastrointestinal nematodes**

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**Application** Pre-mating targeted selective treatment (TST) of ewes against gastrointestinal nematodes (GIN), based on body condition score (BCS) or liveweight can be sufficient to maximise reproductive performance whilst decreasing anthelmintic use.

**Introduction** GIN threatens animal health and productivity globally and estimated to cost the European sheep industry €157-477 million annually (Mavrot et al., 2016). GIN infections are typically controlled by anthelmintics, but due to anthelmintic resistance, Sustainable Control of Parasites in Sheep discourages drenching pre-mating (Abbott et al., 2012). However, a recent survey found that this is practiced by 42% of British farmers (Williams et al., 2021). Ewe reproductive rate greatly influences ewe profitability (Snowder and Fogarty, 2009). Studies show that TST of lambs, where only a proportion of the flock is treated against GIN, reduces resistance development, whilst maximising lamb performance (McBean et al., 2016). This study aimed to identify if BCS and liveweight can be used as measures to identify ewes that benefit from TST against GIN pre-mating.

**Material and methods** 354 Welsh Mule ewes, aged 2-8, were randomly allocated into two groups (anthelmintic treatment and control) on a Welsh farm and grazed together. Flock faecal egg count (FEC) suggested low GIN burdens pre-mating (FEC=215epg). Ewes in anthelmintic treatment group were administered 0.2mg/kg bodyweight of ivermectin. Ewe BCS, weight, and DAG score were recorded pre-flushing, pre-mating and post-mating. Ewes were scanned 70-90 days into gestation. Ordinal regression analysis used to identify factors associated with reproductive performance and a linear regression used to identify factors associated with ewe condition post-mating. In each model, the independent variable was an interacting effect between anthelmintic treatment group and BCS/weight group.

**Results** Mean ewe BCS and weight at mating was 3.38 and 67.4kg, respectively. Mean flock scanned litter size was 1.81. Reproductive performance of ewes with BCS <3, or weighing <60kg pre-mating benefited from anthelmintic treatment against GIN pre-mating ( $P<0.05$ ). There was no significant effect on scanned litter size of treating ewes with an anthelmintic when BCS  $\geq 3$ , or weight  $\geq 60$ kg ( $P>0.05$ ). Treating ewes with BCS <3 or weight <60kg had no significant effect on BCS post-mating.

**Conclusions** Reproductive performance of Welsh Mule ewes with BCS <3 or weight <60kg pre-mating benefited significantly from anthelmintic treatment despite low FEC, which usually implies that anthelmintic treatment has no benefit. TST based on ewe BCS or weight pre-mating may maximise flock performance whilst reducing anthelmintic use. Further research is required to identify optimum BCS and weight thresholds for TST of other breeds and production systems.

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**Table 1. Reproductive performance of ewe treated and untreated against GIN pre-mating grouped via pre-mating BCS and liveweight.**

Ewe category	Mean scanned litter size	B	S.E	Sig
Ewe BCS				
BCS $\geq$ 3 + Drench	1.94	2.16	0.85	0.01
BCS < 3 + Drench	1.82	2.67	1.01	0.01
BCS $\geq$ 3 + No Drench	1.81	2.11	0.85	0.01
BCS < 3 + No Drench	1.20	0.00	-	-
Ewe liveweight				
Liveweight $\geq$ 60 kg + Drench	1.83	1.6	0.44	0.00
Liveweight < 60 kg + Drench	1.80	1.35	0.60	0.02
Liveweight $\geq$ 60 kg + No Drench	1.85	1.66	0.45	0.00
Liveweight < 60 kg + No Drench	1.41	0.00	-	-