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## Raising lambs with intact tails to meet retailer welfare requirements: on farm feasibility and farmer perspectives

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### ABSTRACT

The aim was to study the practical feasibility of raising lambs with intact tails to satisfy welfare concerns over tail-docking. On four farms, two groups of ewes were bred with either a farm ram (Normal) or a Dorper ram (Dorper). Lamb body weight and dag scores were monitored at weaning and before transport to slaughter. Tail length was measured at weaning. Dorper-sired lambs were not tail-docked. Farmers recorded all management procedures and participated in a post-trial questionnaire. On average, the number of handling and health treatments, farm labour and measurements at weaning and transport were similar for the Normal and Dorper-sired lambs. Dag scores averaged 1.2 and 1.3 at weaning, and 0.6 and 0.8 at transport for Normal and Dorper-sired lambs, respectively. Three farms returned a higher value/head for their Dorper-sired lambs. Three farmers stated they would not raise lambs with intact tails in the future unless they received a higher premium. One farmer reported that he would continue to raise undocked Dorper-sired lambs. These results suggest that while it is possible to meet retailer demands for higher welfare standards by raising lambs with intact tails, industry uptake may be dependent on higher premiums that satisfy the perceived extra costs of the farmers.

**Keywords:** lambs; tail-docking; welfare; Dorper; farmer perspective.

### INTRODUCTION

Current shifts in consumer concern over the welfare of animals raised and used for food production are stimulating a change in production and labelling practices throughout the world (Haggerty *et al.*, 2009; Passantino *et al.*, 2008). One of the drivers for change is being exerted through retailers such as Burger King, McDonald's, and UK and US supermarket chains for the adoption of proprietary welfare standards that are enacted at farm level. The change is often being exerted through a system of third-party inspection and certification programmes (Edge *et al.*, 2008; Mench, 2003). These standards, both voluntary and involuntary depending on the market, place an emphasis on natural living and freedom from physical alterations, such as tail-docking. New Zealand is ideally placed to supply lambs under these standards, because relatively minor changes from existing farming practices would be required due to the pasture-based, extensive production systems currently used.

The most challenging changes to current farming practices that are common to certification programmes are the demand for reduced physical alterations, requiring lambs raised for market to be neither tail-docked nor castrated. Tail-docking and castration of lambs are both common practice on New Zealand sheep farms (Fisher *et al.*, 2006; Scobie & O'Connell, 2002; Tarbotton *et al.*, 2002). The main reason for tail-docking is to reduce the accumulation of faecal matter and urine stain, thereby reducing the potential for flystrike (Stafford

& Mellor, 1993; Scobie & O'Connell, 2002). Flystrike has been reported to increase with tail length (Scobie *et al.*, 1999). A recent survey indicated that approximately 96% of New Zealand farmers tail-dock their lambs. The reasons for tail-docking were related to flystrike, dag formation, the health and welfare of the animal and keeping crutching and shearing costs down (Fisher *et al.*, 2006). Instead of removing the long tail to cope with the perceived risks and problems, another alternative is to use breeding to produce an animal with desirable traits such as a shorter and barer tail. Tail length is highly heritable such that a sire and a dam with different tail lengths produce lambs with tails of intermediate length (Scobie & O'Connell, 2002). There are currently a number of potential breeds that could pass on genes for short tails, such as Gotland Pelt and Finnish Landrace (Scobie & O'Connell, 2002). However, these breeds may also confer less desirable traits or lower production.

Another trait that reduces faecal soiling and hence the risk of flystrike is a reduction in the wool cover around the perineum, known as breech bareness (Scobie *et al.*, 2007). The Dorper breed has many desirable traits, including a naturally short and bare tail, a short fleece in the breech and underbelly region due to natural shedding, as well as good carcass characteristics and a wool-less face. Crossbreeding using the Dorper produces a reduction of fleece cover in the tail and breech region (Merrick, 2003). Potentially it may therefore also reduce the risk of flystrike while potentially not affecting the lamb's growth rate.

The main objective of this study was to carry out an initial investigation into the on-farm feasibility of raising lambs with intact tails, with a focus on farm management implications and outcomes. Although we chose to use a Dorper sire to produce undocked lambs, the study was not designed as a breed comparison. The Dorper breed was used to reduce the risk of flystrike associated with long-tailed lambs thereby eliminating one of the major reasons for tail-docking. To reduce the potential welfare risk of the study, it was carried out on a small scale using four farms.

To gain an insight into the practical, welfare and financial consequences of raising lambs with intact tails in comparison with normal docked lambs, all management procedures used from birth to slaughter were recorded on 304 docked (Normal) and 326 undocked (Dorper-sired) lambs.

## MATERIALS AND METHODS

### Farms and animals

All procedures involving animals were approved by the Ruakura Animal Ethics Committee under the New Zealand Animal Welfare Act 1999.

Four farms, identified as A, B, C and D, located in the Wairarapa region, with an average size of 506 ha (range 283 to 910 ha) and total sheep numbers ranging from 800 to 6,000 stock units were selected. All farmers were interviewed prior to the start of the trial to gain information on current management practices, farm size, stock numbers and breed of animals.

### On-farm procedures

On each farm, two groups of ewes of the same breed (Farm A – Perendale and Farms B, C and D – Romney) were selected and mated with either an existing, docked, breed of long-tailed sire or a Dorper sire sourced from a North Island Dorper breeder. The existing ram (Farm A - Dorset Down; Farm B – Suffolk; Farm C – South Suffolk and Farm D - Texel) and the Dorper ram were joined with their respective groups of ewes on the same date on each farm in March-April 2007. The number of ewes mated with either the existing or Dorper ram on each farm were: Farm A - 50/50; Farm B - 49/48 Farm C - 48/68 and Farm D - 49/49, respectively. After mating, the two groups of ewes were grazed together according to normal farm practice until just before lambing when they were again divided into the same two groups. The resulting lambs were categorized as the Normal group (lambs sired by the existing ram) and the Dorper-sired group (lambs sired by the Dorper ram) and grazed as two separate mobs that were managed similarly for the duration of the trial. The Normal group were tail-docked at approximately three weeks of age and managed according to the farmer's

usual procedures. The Dorper-sired groups were not tail-docked and received animal health treatments as deemed appropriate by the farmer. No male lambs were castrated however Farmers B and C rendered their Normal male lambs cryptorchids by shortening the scrotum. Both groups were weaned no earlier than 12 weeks of age and transported to slaughter at the farmer's discretion at approximately 25 to 28 weeks of age. All management procedures and the number of hours spent in handling and treating each group were recorded by the farmer.

### Measurements

Tail length and length of the bare skin on the underside of the tail of the Dorper-sired lambs were measured at weaning, as described by Walker and Young (2009) when lamb live weight and dag score of all animals were also recorded. Dag score (an estimate of faecal soiling) was recorded using a 6-point scale ranging from 0 (No dags) to 5 (Very daggy) as described by Young (2006). Weight and dag score for all animals were measured again one to four days before transport to slaughter.

All farmers aimed to send lambs to slaughter according to the live weight that would gain a premium price. However, due to unforeseen drought conditions during the trial, lambs were occasionally sent at what was considered a less than optimal weight. After all the lambs had been sent to slaughter a telephone questionnaire was conducted with each farmer to gain their perspective on any management differences between the two groups.

### Data analysis

Results are presented descriptively as means  $\pm$  standard deviation (SD). A t-test on farm means, across all animals in each group, was used to detect any difference in the variables measured between the Normal and Dorper-sired lambs.

## RESULTS

### Handling and health treatments

The number of lambs measured at both weaning and transport on Farms A to D in the Normal and Dorper-sired groups were 72/62, 75/74, 93/124 and 64/66 respectively with a total of 304 Normal lambs and 326 Dorper-sired lambs. There was no significant difference in the number of handling and health treatments ( $P = 0.09$ ) between the Normal and Dorper-sired lambs on each farm. The number of events ranged from 22 for Farmer C to 50 for Farmer D. This included procedures such as drenching, flystrike treatment, crutching and tail-docking. The only differences in treatments carried out between the groups within a farm, with the exception of tail-docking, were; Farmer A treated an individual Dorper-sired lamb for flystrike, Farmer D dipped his Normal lambs to protect against external

**TABLE 1:** Mean  $\pm$  standard deviation for live weight, dag score (0 = No dags to 5 = Very daggy), tail length and bare skin length measurements at weaning ( $\geq 12$  weeks of age) and at transport (25-28 weeks of age) for all Normal lambs (tail-docked) sired by the existing rams across the existing ewes over four farms and all Dorper-sired lambs (not tail-docked) sired by a Dorper ram across the existing ewes on the same four farms. NA = Not applicable.

Group	Total number of lambs	Live weight (kg)		Dag score (0-5)		Tail length (cm)	Bare skin (cm)
		Weaning	Transport	Weaning	Transport	Weaning	Weaning
Normal	304	32.5 $\pm$ 6.3	41.8 $\pm$ 3.8	1.2 $\pm$ 1.4	0.6 $\pm$ 0.9	NA	NA
Dorper-sired	326	32.0 $\pm$ 6.6	40.3 $\pm$ 4.0	1.3 $\pm$ 1.3	0.8 $\pm$ 1.0	30.7 $\pm$ 3.3	12.3 $\pm$ 1.8

**TABLE 2:** Mean live weight  $\pm$  standard deviation (kg) at weaning ( $\geq 12$  weeks of age) and at transport (25-28 weeks of age) for all Normal lambs (tail-docked) sired by the existing rams across the existing ewes on each of four farms and all Dorper-sired lambs (not tail-docked) sired by a Dorper ram across the existing ewes on the same four farms.

Group	Farm A		Farm B		Farm C		Farm D	
	Weaning	Transport	Weaning	Transport	Weaning	Transport	Weaning	Transport
Normal	29.3 $\pm$ 4.9	41.8 $\pm$ 2.5	36.5 $\pm$ 5.1	40.8 $\pm$ 2.8	29.1 $\pm$ 5.3	41.1 $\pm$ 5.1	36.3 $\pm$ 5.5	42.5 $\pm$ 3.6
Dorper-sired	28.5 $\pm$ 4.7	41.9 $\pm$ 2.8	38.8 $\pm$ 5.4	42.0 $\pm$ 3.0	27.8 $\pm$ 3.9	37.7 $\pm$ 3.9	35.7 $\pm$ 4.6	41.8 $\pm$ 3.4

**TABLE 3:** Total hours of farm labour for groups of Normal lambs (tail-docked) sired by the existing rams across the existing ewes on each of four farms and all Dorper-sired lambs (not tail-docked) sired by a Dorper ram across the existing ewes on the same four farms.

Group	Farm A	Farm B	Farm C	Farm D	Average across all farms (P = 0.97)
Normal	345	795	1,110	820	768 $\pm$ 316
Dorper-sired	340	675	1,000	1,040	764 $\pm$ 326

parasites but did not dip his Dorper-sired lambs and Farmers B and C rendered their Normal male lambs cryptorchids at tail-docking. The number of times an animal husbandry treatment was carried out varied across farms. Crutching ranged from once on Farm C to four times on Farm D. Farmers A, C and D used flystrike treatments and dips, whereas Farmer B did not. Farmer D drenched his lambs seven times, Farmer A drenched his lambs five times and Farmers B and C drenched their lambs four times.

### Body measurements

On average across all four farms, live weight recorded at weaning (P = 0.88) and transport (P = 0.51) were not significantly different between the two groups (Table 1). The mean group live weight at weaning and at transport from each farm is shown in Table 2.

Average dag score across all farms at weaning (P = 0.78) and transport (P = 0.14) were not significantly different between the two groups (Table 1). The highest average farm dag score at weaning was 2.2 in the Normal group on Farm C, and at transport it was 1.2 in the Dorper sired group Farm B. The lowest average farm dag score at

weaning was 0.3 in the Normal group on Farm B and at transport it was 0.4 in the Dorper-sired group on Farm C. Despite the low average dag scores, some lambs did have a high degree of soiling. Scores of 5 were recorded at weaning in both groups on Farm C and in the Dorper-sired group on Farm A. Individual scores of 4 were also recorded for lambs from all farms and groups at transport. Average tail and bare skin length for all Dorper-sired lambs was 30.7  $\pm$  3.3 cm and 12.3  $\pm$  1.8 cm respectively. The percentage of bare skin on the underside of the tail averaged 42% of the full tail length.

### Financial returns

Although not significant (P = 0.37), at slaughter Dorper-sired lambs from Farms A, B and D returned on average a slightly higher value (\$/head) than Normal lambs (Figure 1). The average carcass weight (P = 0.74) for each group from each farm followed the same trend (Figure 2). On average, Dorper-sired lambs were valued at \$73  $\pm$  11 /head and Normal lambs at \$69  $\pm$  19 /head whereas on average Dorper-sired lamb carcass weight was slightly lower than Normal lambs (Dorper-sired,

17.9 ± 2.1 kg; Normal, 18.0 ± 2.0 kg). The slightly higher value per head for the Dorper-sired lambs could be explained by the grades allocated to the carcasses by the processor. This data has not been analysed.

**Farmer’s time and perceptions**

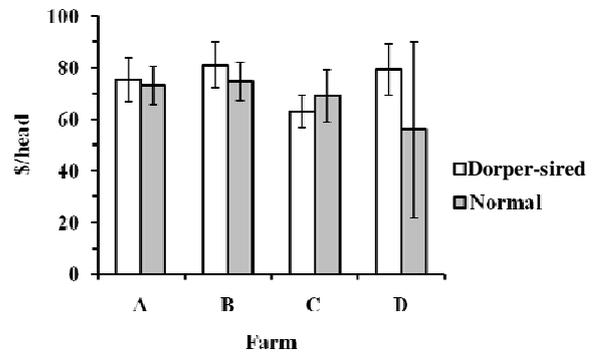
In the post-trial questionnaire Farmers A, C and D reported that Dorper-sired lambs required more work than Normal lambs mainly due to the longer time taken to crutch each lamb. However, the total number of hours of farm labour recorded by the farmers for each event showed that the total time spent working with each group was, on average, very similar (Table 3). These three farmers also stated they would not consider raising lambs with intact tails in the future unless they returned a premium above that of docked lambs. The reasons for this included increased management risks, extra work and lack of financial reward. Interestingly, Farmer B reported that he would continue to raise Dorper-sired lambs. He considered that his Dorper-sired lambs gained weight more quickly than his Normal lambs which meant he could sell them earlier and gain a higher premium. In addition, because the Dorper-sired lambs could be drafted to slaughter sooner, less crutching was required. All farmers reported that they would continue to dock their breeding animals even if they decided to raise lambs with intact tails. The reasons for this ranged from the ease of keeping the ewes clean and management issues associated with flystrike, to being consistent with the industry and concern about neighbours’ comments.

**DISCUSSION**

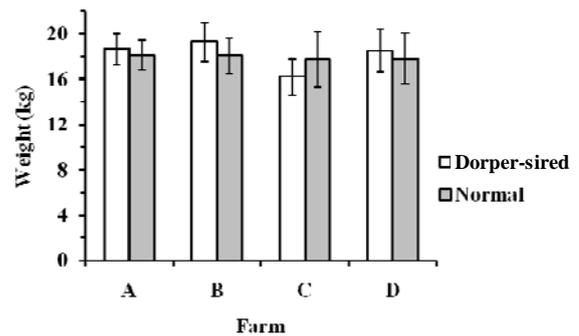
The main objective of this research was to investigate the feasibility of raising lambs with intact tails to meet welfare concerns. A Dorper sire was used to reduce the perceived risks of flystrike. There was no apparent increase in negative welfare issues for the Dorper-sired lambs with intact tails among the four farms that participated in the current study. However, as this was an initial study involving only four farms from a similar region, care needs to be taken in extending these findings more widely. The results of this study would give confidence in evaluating this procedure on a larger number of farms in the future.

Only one lamb, a Dorper-sired lamb, was recorded as being treated for flystrike during the entire study. This low incidence in Dorper-sired lambs might not be predicted from the study by Scobie *et al.* (1999) who suggested that flystrike prevalence increases with tail length. However, a possible explanation is that even with relatively long tails, Dorper-sired lamb dag scores were no higher than the docked animals. This is consistent with a

**FIGURE 1:** Average dollar value of carcass ± standard deviation (\$/head) after slaughter for all Normal lambs (tail-docked) sired by the existing rams across the existing ewes on each of four farms and all Dorper-sired lambs (not tail-docked) sired by a Dorper ram across the existing ewes on the same four farms.



**FIGURE 2:** Average carcass weight ± standard deviation (kg) after slaughter for all Normal lambs (tail-docked) sired by the existing rams across the existing ewes on each of four farms and all Dorper-sired lambs (not tail-docked) sired by a Dorper ram across the existing ewes on the same four farms.



later study by Scobie (2003) which reported that the risk of flystrike was related to the extent of faecal soiling rather than the length of the tail *per se*. In the present study, relatively low average dag scores and virtually no flystrike in both groups support this theory. The relatively low dag scores, despite long tails, in the Dorper-sired lambs could be due to the breed, wool characteristics and amount of bare skin on the underside of the tail. Dorpers have a fleece of wool and hair and have little covering around the breech region (Merrick, 2003). In this study, fleece characteristics were not evaluated, however, farmers and technical staff working on the study frequently commented on the hair-like appearance of the Dorper-sired lambs. The percentage of bare skin on the underside of the tail was 42% at weaning in the Dorper-sired lambs and similar to that calculated from the study of Scobie *et al.* (2007) at docking. There are many factors, such as climate, parasite load, and pasture quality (Heath, 1994; Morley *et al.*, 1976, Waghorn *et al.*, 1999) that contribute to faecal soiling which can lead to flystrike. These

were not evaluated in this study. However, good management practices and possibly the drought conditions, may have contributed to the near-zero incidence of flystrike in the present study.

The live weights of the Dorper-sired lambs were similar to the Normal lambs at weaning and transport. However, on three of the four farms the Dorper-sired lambs returned a higher value per head at slaughter, with one farmer receiving \$23 per head more for Dorper-sired lambs than his Normal lambs. This is most likely due to a combination of higher carcass weight, as seen in three of the four farms, and a possible effect of meat grade that was not analysed in this study. Indeed, Snowden and Duckett (2003) reported that their Dorper-sired animals had comparable carcass characteristics to other meat breeds. This could explain the increased financial return from the Dorper-sired lambs. Despite the higher return, three of the four farmers reported they would not continue raising lambs with intact tails in the future. The main reason for this was a perceived lack of financial return associated with a perceived increase in labour costs. This was inconsistent with our analysis. These farmers stated that they would require a premium for lambs with intact tails, above that of docked lambs, as an incentive to introduce this management practice. One farmer reported that he would continue to raise Dorper-sired lambs with intact tails mainly due to the increased returns he could achieve through reduced labour and earlier slaughter without a premium.

In conclusion, the study showed no differences in potential welfare issues between tail-docked lambs and Dorper-sired lambs with intact tails. Therefore, it may be possible to meet the demands of the consumer for reduced physical alterations of lambs. Three of the four farmers received a higher financial return on the Dorper-sired lambs but only one farmer was willing to continue this practice. Indeed, a general perception of increased risk of flystrike and higher labour costs associated with producing lambs with intact tails remained. These perceived costs in comparison to the financial rewards are an important factor influencing the decision to change practices. Premiums paid for lambs with intact tails would therefore undoubtedly influence the extent that this practice would be adopted by farmers.

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