# The reasons farmers choose to dock lamb tails to certain lengths, or leave them intact

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## Abstract

Compared to a survey carried out in 2005, New Zealand farmers appear to be docking fewer lamb tails flush (6% vs. 22%) and docking a greater number of lamb tails at 4-7 cm length (32% vs. 16%). The main reasons for docking were to minimize fly strike risk, reduce accumulation of dags and keep the crutching costs down. Farmers who docked lamb tails to a shorter length (3-4 cm) gave significantly ($P<0.05$) more importance to minimizing fly-strike, reducing the likelihood of dags and reducing the cost of crutching than any other reason. Farmers who docked lamb tails at a longer length (4-7 cm) gave significantly ($P<0.05$) more importance to meeting the processor requirements, minimizing euthanasia from uterine prolapse and minimizing fly-strike risk than any other reason. When farm performance characteristics, that may influence decisions relating to tail docking practices, were prioritised by farmers, preferences for minimizing deaths from fly-strike, improving weaning weight and making more money from the processor were greater than having fewer dag events, less euthanasia from rectal prolapses and less stress for the lamb at docking. These preferences did not differ among farmers that dock tails at different lengths or leave them intact.

**Keywords:** tail docking; tailing; 1000Minds®

## Introduction

In the United Kingdom farmers are required to dock lamb tails to a length that is sufficient to cover the vulva in the case of female sheep and a similar length in the case of male sheep (DEFRA, 2002). While this tail length is a recommended best practice in New Zealand (NAWAC, 2005) a number of New Zealand farmers currently dock slightly shorter than this length. If it is ever proposed that these recommended best practices become legal requirements, it will be important that the sheep industry has a clear understanding of the current prevalence of different docking practices and a clear understanding of the main drivers for the different practices. Understanding these factors, alongside research trials quantifying the effects of docking at different lengths on production and welfare of the lamb and the economic return the farmer, will provide industry with the necessary information to address any potential concerns around tail docking at different lengths, the scale of different practices, and how to target the issue, or, defend current practices accordingly.

## Materials and methods

In an attempt to get a wider understanding of why New Zealand farmers were docking, or not docking, or docking at particular lengths, an online survey was designed and deployed.

*Survey design*

The online survey consisted of three parts. The first part was designed to quantify the prevalence of different docking practices (proportion docked, or left intact, for maternal and terminal lambs), and collect demographic information including gender and age of the farmer, region, type of land, size of farm, number of ewes, breed of ewes, fly-strike incidence, person who carried out tail docking, method for tail docking and source of learning.

The second part asked farmers their motivations for docking, not docking, or docking at a particular length. Farmers were asked to select and rank the three most important reasons from a pre-defined list. To ensure the pre-defined reasons were of relevance, the reasons were taken from a previous survey carried out (Fisher et al. 2006), where open-ended questions were asked to why farmers docked, did not dock, or docked at particular lengths. Relative weights between the different ranks were derived and differences between demographics were analysed.

The third part of the survey used a multiple criteria decision analysis tool (1000Minds®; Hansen & Ombler 2009), where farmers were asked to choose preferred alternatives, repeatedly, between pairs of farm performance characteristics that may influence decisions relating to tail docking practices. Farm characteristics compared included, 2 less fly-strike related deaths per 100 lambs, 1 less dagging event per lamb, 50% reduction in costs due to dagging time, 50% reduction in costs due to crutching time, 0.5kg increase in weaning weight, 1 less uterine prolapse related euthanasia per 100 ewes, 2 less rectal prolapse related euthanasia per 100 lambs, no pain/stress at the time of docking and $1.50 more per lamb at the processor. The tool built a ranked list and determined the relative preference amongst these farm performance characteristics. By including a criterion presented in monetary terms, the tool was also able to convert all relative preferences into perceived economic values in $NZ.

*Farmer selection*

The Beef + Lamb New Zealand (B+LNZ) database was used to select a representative sample of sheep farmers throughout New Zealand. Sheep farmers that had an email address, had not recently been surveyed by B+LNZ and had self-reported an estimate of sheep stock units were eligible for selection. Power analyses indicated that the survey

should be sent to 1490 sheep farmers. This was based on a population size of 12,400 commercial sheep-and-beef-farms in New Zealand, desired precision of 0.05, confidence level of 95%, degree of variability of 0.5 and an estimated response rate of 25%. To ensure survey respondents were representative of the true population, eligible farmers were grouped by region and number of stock units and randomly selected from these subgroups according to the proportion of farmers in each group. Farmers were sent an email asking for their participation, with a reminder sent to those that had not replied by three weeks.

*Survey analysis*

A general descriptive analysis of all the information gathered was implemented and presented in the form of means and proportions. The interactions between farmers demographic and their views and perceptions were analysed using standard statistical analysis of differences among groups; in most cases Kruskal-Wallis and Wilcoxon test for pair-wise comparison were used since no assumptions could be made about the normality of the variables analysed.

## Results

*Response rate*

A total of 283 farmers, 75% of the required 373 responses, replied. The demographic data showed that the majority of farmers surveyed were male and were over 46 years old. All New Zealand regions were represented, with the majority of respondents located in Canterbury, Manawatu/Wanganui, Hawkes Bay, Otago and Southland. Most respondent farms were located in hill or rolling country, with a higher proportion of farms located in hill country for the North Island and in rolling country for the South island. The majority of the respondents used Romney or maternal composites as their maternal breed and Suffolk or terminal composites as their terminal breed. The sampled population distributions for location, type of country, farm size and sheep breeds were similar to B+L NZ distributions and were, therefore, assumed to be representative of the New Zealand sheep industry.

*Proportion of farmers with different docking practices and methods used*

Of those surveyed, 6% of the farmers docked 100% of their lambs, 1.4% of the farmers left 100% of their lambs with intact tails, with the balance (91.3%) choosing to dock a defined proportion. Lamb breed (terminal vs. maternal) had an effect on tail-docking prevalence, with a greater number of respondents choosing to dock maternal lamb tails (84%) than their terminal lamb tails (71%). The most common method used for docking lamb tails was the hot iron, with 59% of respondents docking their lamb tails by this method, 39% docking with rubber rings and 2% docking with other methods. These methodologies did not differ between any of the demographic variables tested.

Of the respondents that choose to dock, 6% dock to leave the tail flush, 59% of respondents dock to leave approximately 3-4 cm, 32% dock to leave approximately 4-7 cm and 1.4% dock to leave the tail longer than 7 cm. When docking the tail flush, 80% of respondents use the rubber ring method. When docking the tail at 3-4cm or greater, the hot iron is the preferred methodology.

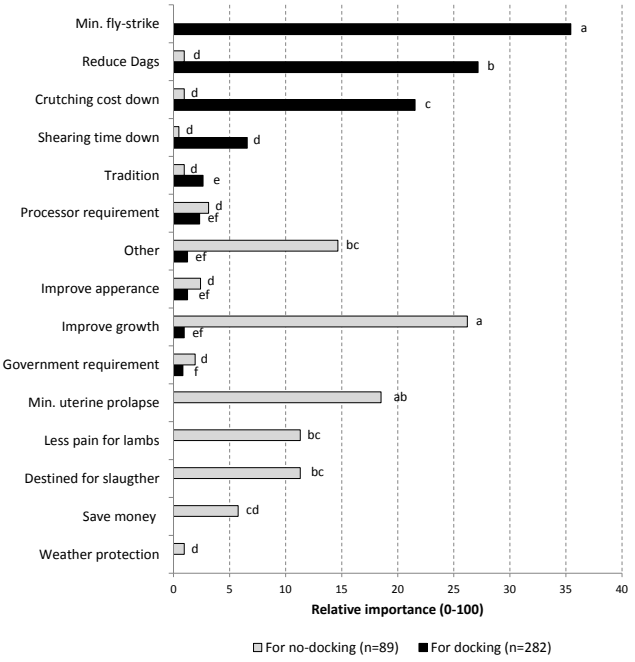
*Reasons for docking lamb tails or leaving them intact, or leaving a particular length*

The three main reasons, ranked in order of importance, for docking lamb tails were to minimize fly strike, reduce accumulation of dags and keep the crutching costs down (Fig 1). For those respondents that left lamb tails intact, the three main reasons, ranked in order of importance, were improving lamb growth and reducing uterine prolapses and other (Fig 1). Further analyses showed that in terms of learning, 45% of farmers indicated that it was just the way they have always done it, 34% indicated that they were guided by the processor, market contracts or animal welfare guidelines, and 12% were guided by other farmers' advice. Analyses also showed that farmers located in the North Island (rank of 2.19) or on hill country (rank of 2.35) gave greater ($P<0.03$) importance to minimizing fly-strike incidence as a reason for docking than those located in the South Island (rank of 1.91) or on rolling or flat country (rank of 1.85-1.87).

The relative importance of the three main reasons given for docking lamb tails at particular lengths are illustrated in figure 2. Farmers who docked lamb tails to a short length (2-4 cm) gave significantly ($P<0.001$) more importance to minimizing fly-strike (relative importance of 24.8 vs. 13.7), reducing the likelihood of dags (relative importance of 36.7 vs. 12.7) and reducing cost and time of crutching (rank of 20.0 vs. 5.8) and shearing (rank of 6.6 vs. 1.8) than farmers who docked to a longer length (4-7 cm). Farmers who docked tails at a longer length (4-7 cm) gave significantly ($P<0.001$) more importance to reducing uterine prolapse (relative importance of 13.5 vs. 3.8) and to processor requirements (relative importance of 18.9 vs. 4.8) than farmers who docked tails at a shorter length (3-4 cm). There were not enough respondents within the group who dock tails flush or within the group who dock tails greater than 7cm to understand the reasons for doing so.

Further analyses showed that source of learning had an impact on what length farmers chose to dock. Farmers who leave short tails (3-4 cm) were more likely to answer that it was the way they have always done it, and farmers who leave a long tail (4-7 cm) were more likely to follow processor and/or market contract requirements. The learning source was also related to the reasons farmers leave a particular length. Farmers who dock the way they have always done it and/or followed farmers' advice higher importance to reduce crutching costs, dag likelihood and minimize fly strike and less importance to reducing uterine prolapse than farmers who follow the advice of consultant, processors or governmental guidelines.

**Figure 1** Relative importance of the different reasons[1] given for either docking lamb tails (dark bars) or not docking (lighter bars).

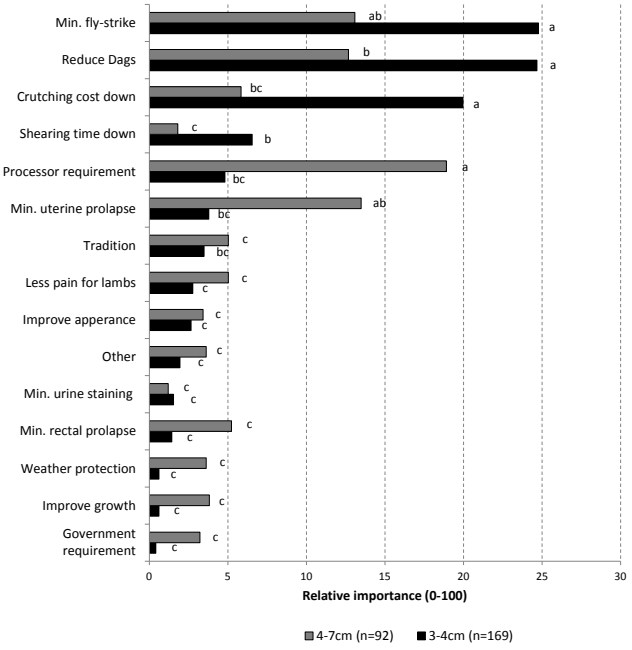



[1]Min. fly-strike (to minimize the risk of fly-strike), Reduce Dags (to reduce the accumulation of dags), Crutching cost down (to keep the crutching cost down), Shearing time down (to keep the shearing time down), Tradition (it is just what I have always done), Processor requirement (it is a requirement from the processor), Improve appearance (it improves the appearance of the lamb), Other, Improve growth (it improves lamb growth to slaughter), Government requirement (it is a government requirement), Min uterine prolapse (to minimise the risk of uterine prolapse), Less pain for lambs (reduce pain at the time of docking), Destined for slaughter (because they are destined for early slaughter), Save money (to save the cost of docking), Weather protection (to protect vulva or anus from weather). Bars of the same colour with different letters do differ statistically according to K-W test.

*Methodology 2 (pair-wise ranked comparisons)*

At the whole population level (Fig 3), the results show that respondents have a similar preference for the first three ranked traits (minimizing deaths from fly-strike, improving weaning weight and making more money at the processor). The respondents have a greater preference for these traits than for having fewer dag events, having less euthanasia due to rectal prolapses and for the lamb to have less stress at the time of docking. The remaining three traits (less euthanasia due to uterine prolapse, less dags costs and crutch costs) had medium importance for farmers. If converted to dollars (economic preferences) the results show that respondents give similar value to the first three traits (minimizing deaths from fly-strike, improving weaning weight and less cost for dagging (average value of $1.89; Fig 4). The lower dollar value was given to lambs having less stress ($1.45). The remaining four traits (less euthanasia due to uterine prolapse, less crutching costs, less dag and less euthanasia due to rectal prolapse) had an intermediate dollar value for farmers (average value $1.55). There were no differences in relative or economic preferences among farmers that dock, or don't dock, or dock at 3-4 cm and 7-8 cm (Table 2).

**Figure 2** Relative importance of the different reasons[1] given for docking lamb tails at a particular length short (3-4cm; darker bars) or long (4-7cm; lighter bars)




[1]Min. fly-strike (to minimize the risk of fly-strike), Reduce Dags (to reduce the accumulation of dags), Crutching cost down (to keep the crutching cost down), Shearing time down (to keep the shearing time down), Processor requirement (it is a requirement from the processor), Min. uterine prolapse (to minimise the risk of uterine prolapse), Tradition (it is just what I have always done), Less pain for lambs (reduce pain at the time of docking),Improve appearance (it improves the appearance of the lamb), Other, Min. Uterine prolapse (to minimize the risk of uterine prolapse), Min. rectal prolapse (to minimize the risk of rectal prolapse,) Improve growth (it improves lamb growth to slaughter), , Weather protection (to protect vulva or anus from weather), Government requirement (it is a government requirement). Bars of the same colour with different letters do differ statistically according to K-W test.

## Discussion

The current prevalence of different docking practices within New Zealand, in particular docking lamb tails distal to the caudal folds, appears to have changed. Compared to survey results collected in 2005 by Fisher et al. (2006), this survey has shown that New Zealand farmers appear to be docking fewer lamb tails flush (6% vs. 22%) and docking a greater number of lamb tails at 4-7 cm (32% vs. 16%). Considering research trials have previously shown that docking lamb tails flush is unacceptable in terms of greater risk of fly strike, tail infection and risk of rectal prolapse (Thomas et al., 2003), and that the current recommended best practice in New Zealand is to dock distal to the caudal

**Figure 3** Differences among the relative preferences for different farm performance characteristics including, Less fly-strike (2 less fly-strike related deaths per 100 lambs), Greater weaning weight (0.5kg increase in weaning weight), More $ at the processor ($1.50 more per lamb at the processor), Less dag costs (50% reduction in costs due to dagging time), Less crutch costs (50% reduction in costs due to crutching time), Less euthanasia from uterine prolapse (1 less uterine prolapse related euthanasia per 100 ewes), Less dag events (1 less dagging event per lamb), Less euthanasia from rectal prolapse (2 less rectal prolapse related euthanasia per 100 lambs), and No stress at docking (no pain/stress at the time of docking). Bars with different letters do differ statistically according to K-W test

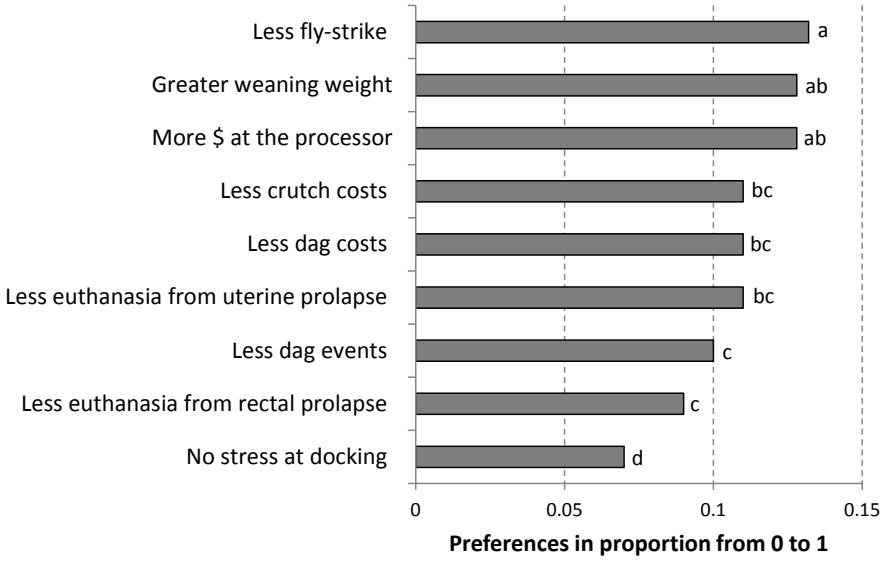
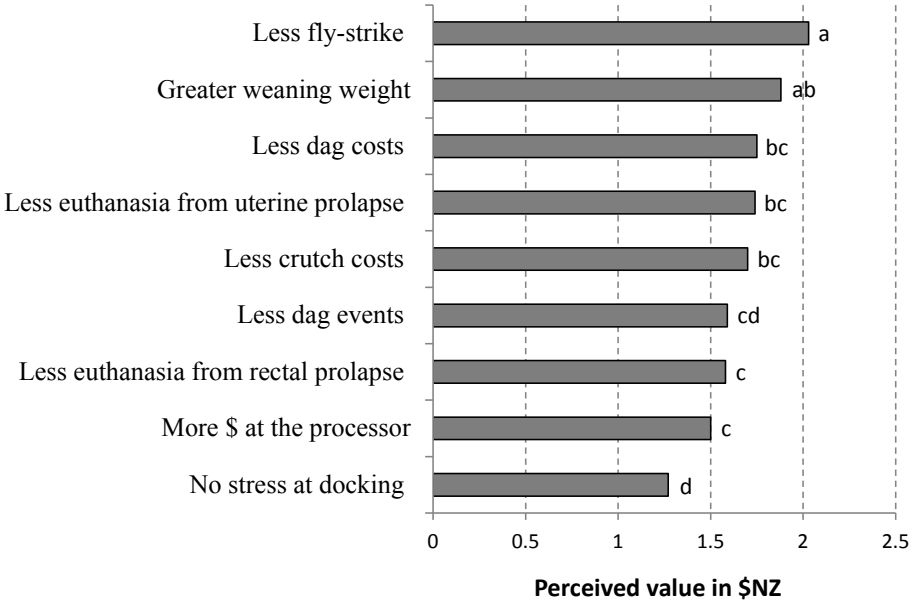



**Figure 4** Differences among the perceived values in $NZ for different farm performance characteristics including, Less fly-strike (2 less fly-strike related deaths per 100 lambs), Greater weaning weight (0.5kg increase in weaning weight), Less dag costs (50% reduction in costs due to dagging time), Less crutch costs (50% reduction in costs due to crutching time), Less dag events (1 less dagging event per lamb), Less euthanasia from uterine prolapse (1 less uterine prolapse related euthanasia per 100 ewes), Less euthanasia from rectal prolapse (2 less rectal prolapse related euthanasia per 100 lambs), More $ at the processor ($1.50 more per lamb at the processor), and No stress at docking (no pain/stress at the time of docking). Bars with different letters do differ statistically according to K-W test




folds (NAWAC, 2005), this is a promising sign in terms of meeting current best practice requirements on-farm.

When farmers were asked directly the reasons for docking or leaving the tail intact the three main reasons given were to minimize fly strike, reduce accumulation of dags and keep the crutching costs down. These results were identical to those reported by Fisher et al., (2006) and suggest that the three main reasons for docking lamb tails in New Zealand have not changed. For those farmers that left all lamb tails intact, the three main reasons were improving lamb growth, reducing uterine prolapse and other. It was interesting to note "other" reasons were important for not docking lamb tails. Unfortunately, we have no way of understanding what these "other" reasons could be.

When farmers were asked directly the reasons for docking at a particular length, results showed that farmers who docked lamb tails to a short length (3-4 cm) gave significantly ($P<0.05$) more importance to minimizing fly-strike, reducing the likelihood of dags and reducing the cost of crutching than any other reason. Farmers who docked lamb tails at a long length (4-7 cm) gave significantly ($P<0.05$) more importance to meeting the processor requirements, minimizing euthanasia from uterine prolapse and minimizing fly-strike risk than any other reason. These findings are in contrast to those of Fisher et al (2006), who showed that the main reasons for tail docking at a particular length were similar regardless of the length at which tail were docked.

Demographic analyses showed that farmers in the North Island or farming on hard hill country gave greater importance to minimizing fly-strike incidence than those in the South Island or farming flat or rolling country.

These results are likely to be explained by the climatic differences between islands and the more extensive nature of farming on hard hill country. While the demographic survey asked farmers for data on fly-strike prevalence, unfortunately, the pre-defined brackets were too large, with 81.5% of farmers selecting a fly-strike prevalence of 1-5%. Due to the lack of variation we were unable to see if there were statistical differences in fly-strike prevalence between different demographics and whether fly-strike prevalence influenced tail-docking decisions.

Sources of leaning also appeared to drive farmer's behaviour in tail-docking practices. It would be of interesting to understand if there was a difference in typology between farmers that are following processor and/or market contract requirements and those farmers that answered that it was the way they have always done it. Of the data available there were no differences among regions, type of land, farm size, number of ewes, age and gender.

When farmers were asked to prioritise farm performance characteristics that may influence decisions relating to tail docking practices, farmers had similar preferences for minimizing deaths from fly-strike, improving weaning weight and making more money at the processor. These preferences were greater than having fewer dag events, less euthanasia events from rectal prolapses and for the lamb to have less stress at the time of docking. These preferences did not differ among those farmers that dock lamb tails, don't dock tails, or from docking at particular length. While this general descriptive statistical analysis gave a good overview of farmer's preferences, such results on farming-related issues are known to be very heterogeneous with preferences often being correlated. This means that, overall, only the most important issues and least important issues can be statistically differentiated. Based on practical knowledge in this area, groups of farmers with different patterns of preferences were expected to exist, and further multivariate analyses were undertaken to see if different hidden patterns of farmer's preferences could be found (Martin-Collado et al., 2015).

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