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## BEHAVIOUR OF HILL COUNTRY SHEEP BREEDS DURING FARMING ROUTINES

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### SUMMARY

The behaviour of different sheep breeds was studied over two years during normal hill country farming routines. The studies covered behaviour at lambing, docking, weaning, yarding, catching, shearing and mating. Breed differences were found to be important in these farming routines. In general, the data collected support the assessment of the breeds made by the shepherds.

### INTRODUCTION

Changing breeds is a recommended technique to increase productivity from hill country sheep. Interest has increased recently in the merits of different sheep breeds for different farming systems, particularly with the impending exploitation of the new imported breeds. In the choice of breed, the farmer is perhaps more strongly influenced by breed behaviour differences than by comparative production data which are difficult to obtain under farm conditions.

Subjective opinions based on farmer experience have drawn attention to breed differences in behaviour and a survey of the literature indicates that some of these differences may be significant. The literature shows breed differences in learning ability (Severinsen, 1971), suitability for indoor husbandry (Williams, 1967), an ability to keep to their own breed groups (Winfield and Mullaney, 1973) and territory (Hunter, 1960).

Grazing and feeding behaviour of different breeds has been compared by England (1954), Arnold and Dudzinski (1967) and Arnold and Bush (1968). Distance travelled and resting time were studied by Browns (1971), Cresswell (1957), Louw *et al.* (1948), Sharafeldin and Shafie (1965), Squires and Wilson (1971) and Wilson and Hindley (1968).

The literature is not so extensive on perinatal lamb mortality in different breeds which is a major area for attention in New Zealand. The Merino appears to have had most attention (Alexander and Peterson, 1961; Watson 1972; Langlands, 1972).

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Mating behaviour of different breeds of rams has been studied by Land (1970) and among ewe lambs by Lees and Weatherhead (1970) and Lees (1971).

Few of these studies relate directly to the assessment of behaviour differences in hill country breeds during normal farming routines. This study gives some preliminary results.

#### MATERIALS AND METHODS

The study was carried out at the Whatawhata Hill Country Research Station in 1972 and 1973 using sheep involved in a long-term breed performance study. Flocks were established in 1969 by obtaining ewes from a wide genetic base through the co-operation of breed associations, who also provided new rams each year. Initially each flock consisted of 200 age-balanced ewes. Flocks were run together, except at mating.

The breeds and crosses used in this study for the two years, 1972 and 1973, were the Romney, Coopworth  $\times$  Border Leicester-Romney (termed Border-Romney), Perendale, Cheviot, Corriedale, Polled Dorset  $\times$  Romney (interbred), Merino  $\times$  Romney, and Drysdale  $\times$  Romney. The Merino was present only in 1972.

Behaviour was studied at lambing, docking, weaning, yarding, shearing and mating, although not all studies were carried out in both years.

At lambing the shepherds recorded whether the ewe lambed in a sheltered or exposed position. The reaction of the ewe to the approach of the shepherd and his dog (flight distance) was then classified into four groups: (1) The ewe standing over the lamb; (2) Withdrawing to an immediate distance within sight of the lamb; (3) Deserting but returning later; (4) Complete desertion. During lamb tagging and weighing shepherds assessed mothering (strength of maternal drive) and milk potential from udder size, into good, average or poor classes. As a further reflection of mothering ability, the breeds of ewes were classed in merit order for returning to look for the lamb during separation at docking and weaning.

At shearing, the time taken to drive a similar sized group of each breed through a series of yard pens into the woolshed was recorded, as was the shearer's catching and shearing time.

An attempt was made to study ram behaviour of each breed in March 1973. Accurate data could not be collected because of the rams' mobility and the rugged terrain. Consequently a smaller study of five Romney and five Merino rams was made at another location.

The data collected from these observations are shown as percentages because of the varying number of animals recorded in each exercise each year.

After five years' experience three shepherds were asked to rate the breeds on the basis of which were easiest and which most difficult to manage during farm routines to assess their viewpoint of each breed.

## RESULTS AND DISCUSSION

### BREED ASSESSMENT BY SHEPHERDS

The experience of three shepherds with the different breeds handled over a period of five years proved a valuable basis for assessing stockmen's reactions. Their experience covered handling the sheep in at least 10 yardings and 45 paddock routines each year. Table 1 summarizes this assessment and indicates that a breed which is easily handled in paddock or yard is not considered easiest to catch or physically handle for routine jobs.

TABLE 1: RATINGS OF SHEEP BREEDS BY THREE SHEPHERDS FOR HANDLING DURING FARM ROUTINES

<i>Activity</i>	<i>Easiest</i>	<i>Most Difficult</i>
Reaction to dogs	Perendale, Merino-Romney	Border-Romney Dorset-Romney
Mustering	Perendale, Cheviot	Romney
Working in yards	Perendale, Cheviot	Romney
Filling catching pens	Cheviot, Perendale	Merino-Romney Dorset-Romney
Drafting	Perendale Border-Romney	Romney
Dagging, crutching	Romney, Border-Romney	Perendale, Cheviot
Drenching	Romney	Perendale, Cheviot

### LAMBING BEHAVIOUR

Table 2 summarizes the results at lambing for six breeds over two years. The table first presents details of lamb production as a base to which behaviour observations are related. For example, the Border-Romney produced most twins but the expected higher mortality in twins did not occur because of the breed's good mothering ability.

The extra work for shepherds caused by assisting ewes and general mothering problems was greatest for the Romney.

TABLE 2: LAMBING AND BEHAVIOUR RESULTS FROM SIX BREED GROUPS IN 1972 AND 1973

Expressed as % of ewes which lambed in each group

	<i>Border- Dorset- Peren-</i>						
	<i>Year</i>	<i>Romney</i>	<i>Romney</i>	<i>Romney</i>	<i>dale</i>	<i>Cheviot</i>	<i>Merino</i>
Lambing % (lambs born/ewes lambed)	72	114	122	—	125	118	100
	73	105	120	119	112	114	—
Dead lambs %	72	10	3	—	5	12	15
	73	7	3	5	5	1	—
Twins %	72	26	40	—	40	30	0
	73	10	33	31	26	25	—
Singles %	72	74	60	—	60	70	100
	73	90	67	69	86	75	—
Assisted %	72	6	3	—	2	2	0
	73	3	1	6	2	0	—
Mothering problems %	72	9	5	—	2	4	2
	73	4	1	7	3	0	—
Sheltered %	72	48	65	—	59	60	55
	73	78	81	82	87	95	—
Approach of shepherd							
Stood %	72	47	71	—	48	28	11
	73	57	85	82	70	65	—
Intermediate distance %	72	42	26	—	42	47	38
	73	32	13	16	24	19	—
Desert/return %	72	7	3	—	8	13	28
	73	4	1	2	6	15	—
Desert %	72	4	1	—	2	12	23
	73	6	1	1	0	0	—
Mothering							
Good %	72	57	87	—	74	65	39
	73	65	91	88	86	96	—
Average %	72	36	12	—	25	31	35
	73	26	8	11	13	4	—
Poor %	72	7	1	—	1	5	26
	73	8	1	1	1	0	—
Adequate milk %	72	97	100	—	99	100	98
	73	98	99	100	100	100	—
Lamb stealing %	72	0	0	—	½	1	0

There is considerable divergence between seasons in ewes lambing in sheltered positions. However, although this is open to fairly wide interpretation by shepherds, with the day-to-day variations in weather, within each season the breed difference to seek shelter indicated here would be of great economic importance in adverse conditions. The Romney appeared to be the poorest of all breeds.

The Border-Romneys were the best mothers in terms of standing with their lambs. The Merino was the worst for desertion with only 11% of ewes staying with their lambs at tagging. Cheviots showed a high proportion of ewes which deserted but returned to their lambs. These data confirm the shepherds' assessment of general Cheviot reactions. Using the  $\chi^2$  test (Siegel, 1956), significant differences were found between the reactions of breeds to the approach of shepherd and dog at the 5% level or greater except between Romneys and Perendales in 1972 and between Border  $\times$  Romney and Dorset  $\times$  Romneys in 1973. The rank order of breeds was the same for both years.

The shepherds' assessment of maternal drive considered the Border-Romney best and Merino worst. All breeds appeared to have adequate milk supply.

Lamb stealing was found in the Perendale and Cheviot. This evidence of lamb stealing in hill country is a reflection of strong maternal drive in these breeds and could increase with further selection for easy-care sheep.

#### DOCKING BEHAVIOUR

It was considered that the ewes with the strongest bond and best mothering ability would be found nearest the central lamb pen during temporary separation for docking. Data were recorded using the mobile pen in each paddock. The

TABLE 3: PERCENTAGE OF TOTAL EWES REMAINING WITHIN 20 m OF CENTRAL LAMB HOLDING PEN AT DOCKING

Recorded at 5-min intervals until completion of docking

Breed	No.	Intervals (min)							
		5	10	15	20	25	30	35	40
Romney	115	32	35	26	26	17	15	12	4
Border-Romney	158	28	28	28	23	17	11	10	6
Perendale	280	32	32	29	25	17	15	9	4
Cheviot	117	39	49	38	18	18	10	10	4
Dorset-Romney	151	36	26	23	25	21	12	9	3

lambs were caught and docked at random, then returned to the ewes. The breed of ewes within 20 m of the lamb docking pen was recorded at 5 min intervals. The results in Table 3 show the percentage of ewes in each breed recorded. The breeds show a similar percentage present near the lambs except for the Cheviot which shows a greater percentage in the initial three time periods.

#### WEANING BEHAVIOUR

The ewes were studied the day after weaning (day 2) after being separated from the lambs by a distance of 0.8 km, although within earshot and sight of each other. Many of the ewes had "camped" overnight in the corner of the paddock nearest to the lambs and were spread out along the fence lines on either side of an entrance gate. Fifty metres along each fence line was cleared of sheep and one hour was allowed for any ewes to drift back. These ewes were then separated from the main flock of 1400 ewes and their breeds recorded (observation 1). The same procedure was repeated one-and-a-half hours later (observation 2). The following day (day 3) no ewes or lambs were found on fence lines.

TABLE 4: PERCENTAGE OF EWES FROM TOTAL FLOCK PRESENT AT THE CLOSEST POINT TO WEANED LAMBS ON THE DAY AFTER WEANING, 1973

<i>Observation</i>	<i>Romney</i>	<i>Border-Romney</i>	<i>Dorset-Romney</i>	<i>Merino-Romney</i>	<i>Perendale</i>	<i>Cheviot</i>
1	35	24	28	28	17	25
2	14	16	10	7	7	12

The results are shown in Table 4. The Romney appears to have maintained a stronger lamb attachment up to the time of weaning compared with the Perendale. Ideally a ewe should have given full maternal support to the lamb in early infancy and this should have declined towards the time of natural weaning. This process appears to have happened least in the Romney. A higher intensity of mothering ability early in lactation and a more rapid decline in certain breeds warrants further study.

#### HANDLING BEHAVIOUR IN YARDS

During drafting and preparation for shearing a group of 80 ewes of each breed in full 12-months wool was put through a

TABLE 5: RANK BASED ON TIME FOR BREED GROUPS OF 80 SHEEP TO COMPLETE A 95 m COURSE

Data for 1972 and 1973 combined.

<i>Breed</i>	<i>Flat Yard</i>	<i>Rank Order</i> <sup>1</sup> <i>Steep Yard</i>	<i>Total</i>	<i>"Lead" Animal</i> (1973)
Romney	5½	8	8	6
Border-Romney	5½	7	7	4
Dorset-Romney	3	6	6	5
Merino-Romney	4	3	4	2
Drysdale-Romney	9	9	9	7
Corriedale <sup>2</sup>	8	4	3	—
Perendale	7	5	5	3
Cheviot	2	1	1½	1
Merino <sup>2</sup>	1	2	1½	—
Time range (sec)	42-76	66-136	132-285	108-273

<sup>1</sup> Rank order: 1 = fastest; 10 = slowest.<sup>2</sup> 1972 data only.

complex yard layout using one shepherd with one dog. The same shepherd and dog were used in 1972 and 1973. Photographs taken from above the mob indicated some differences in movement patterns between breeds. Animals were timed from each pen with opened gates on their way to the shearing shed, over a route which included a flat and steep section. The shepherd was required to close the gate after passing through. Table 5 shows the ranking for speed of movement. The Cheviots moved decisively but tended to show a twisting movement after entering each yard, apparently to keep the shepherd and the dog in view. Breeds such as the Romney followed on well after lead animals, but could easily be led into blind corners. The other breeds showed much less independent movement compared with the Cheviot. The Merino, predicted to be the most difficult to handle, moved well and ranked well as did the Merino × Romney in 1973.

The time range gives an indication of breed differences in speed of handling which with larger flocks and time restrictions are of great practical importance. The recorded times confirmed the shepherds' assessment of yard handling (Table 1) where they rated the Cheviot highly and the Romney poorly. However, their assessment of the Perendale as superior to the Cheviot could not be confirmed by the time trials.

#### SHEARING BEHAVIOUR

The shepherds' assessment would indicate that in reaction to physical handling such as shearing the Romney would rank

TABLE 6: AVERAGE TIME OF SIX SHEARERS TO CATCH AND SHEAR A SHEEP OF EACH BREED

(4 shearers in 1972; 2 in 1973)

<i>Breed</i>	<i>Catching Time (sec)</i>		<i>Shearing Time (min, sec)</i>	
	<i>Mean</i>	<i>Range</i>	<i>Mean</i>	<i>Range</i>
Romney	10.7	4-21	1 m 46 s	1,15-3,49 s
Border-Romney	10.5	4-20	1 m 21 s	0,51-2,13 s
Dorset-Romney	10.2	4-19	1 m 24 s	1,00-2,23 s
Merino-Romney	9.8	5-20	1 m 46 s	1,05-3,58 s
Drysdale-Romney	9.7	4-16	1 m 29 s	0,59-2,33 s
Perendale	10.6	4-20	1 m 20 s	0,55-1,51 s
Cheviot	10.5	4-22	1 m 14 s	0,49-1,43 s
Corriedale <sup>1</sup>	11.5	6-25	2 m 15 s	1,19-3,46 s
Merino <sup>1</sup>	10.8	5-20	2 m 54 s	1,50-4,56 s

<sup>1</sup> Based on 1972 data only.

best and the Cheviot and Perendale worst. Sheep which struggled and fought should have increased both catching and shearing time as well as shown more body cuts. An attempt to count body cuts was not practicable.

The time to catch and then to shear a minimum of 20 sheep of each breed was recorded for four shearers in 1972 and two shearers in 1973. The results (Table 6) indicate differences of only a few seconds between breeds in average catching times. Average shearing times were increased by the Merino and Corriedale but not by the Merino-Romney. Despite the speed with which Cheviots could be shorn, they were not liked by shearers because of their kicking.

## MATING BEHAVIOUR

Five Merino and five Romney rams were run with 80 ewes on 2 ha of steep hill country at Wairakei Research Station in two paddocks. The courtship sequences of rams appeared to be similar and the breed differences which were shown resulted from the different patterns of ewe dispersal at pasture.

## CONCLUSIONS

- (1) Tolerance of humans and dogs differs between breeds and is reflected in ease of handling especially at lambing.
- (2) The breed which handles well in the paddock or yards appears to resist physical restraint. Handling differences in yards would warrant different stockman techniques.

- (3) The breeds with high maternal drive rate well at lambing and docking but show decreased attachment by weaning.
- (4) Stockman assessments have generally been supported by the data collected in this study.
- (5) Further studies are needed on breed differences in pasture dispersal patterns, ram behaviour and ewe maternal behaviour. The behavioural contribution of the imported breeds can then be used to complement the known behaviour traits of the established breeds.

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