

The breeding structure of the British sheep industry 2003



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A report produced by

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Contents

Chapter 1	Executive summary	4
Chapter 2	Introduction	6
Chapter 3	Methodology	7
Chapter 4	Results	8
4.1	Response rate	8
4.2	Total sheep	9
4.3	Pure breeds of ewe	11
4.4	Crossbreed ewe populations	15
4.5	Ewe flocks	16
Chapter 5	Breeding rams	18
5.1	Ram breeds	18
Chapter 6	Mating structure of the sheep industry	21
6.1	Pure breeding	21
6.2	Cross breeding	22
6.3	Mating of purebred ewes	24
6.4	Mating of crossbred ewes	25
Chapter 7	Hill, upland, and lowland ewe numbers	27
Chapter 8	Contributions of the different breed types to measures of output	28
Chapter 9	Lamb sales	30
Chapter 10	Concluding remarks	32
	Glossary of terminology	33
	Appendix 1 (The Survey Form)	34
	Appendix 2 (The main pure breeds of ewes kept in Britain)	35
	Appendix 3 (Details of flocks containing ewes of different breeds and crossbreeds)	38
	Appendix 4 (The main breeds of ram used at mating 2003)	41

1. Executive summary

This research was carried out to describe the current breeding structure of the British sheep breeding industry and to identify any changes/trends therein, by comparing the results with those from previous breed surveys carried out in 1971, 1987 and 1996.

A single-page postal questionnaire was sent to 60% of British sheep producers registered with the British Wool Marketing Board (BWMB), some 33,548 forms in total. 34% of forms were returned, of which 72% were useable, therefore responses from 8,236 farmers formed the basis of this research report. This is the largest response of any survey carried out on the British sheep breeding industry.

The 15.2 million ewes mated in 2003 were divided evenly between pure breeds and crossbreds. The Hill breeds form the largest purebred group, with the Scottish Blackface (1.7 million, 11.1%), Welsh Mountain (1.6 million, 10.3%) and Swaledale (1.0 million, 6.9%) dominating the sector. In all, some 90 breeds were recorded, including several new breeds that were not identified in previous surveys. There were over 59 breeds which had less than 50,000 but more than a 1,000 ewes; this was 13 more than in the 1996 survey. The main two longwool crossing breeds (Bluefaced Leicester and Border Leicester) were both within this category, and have declined since the previous survey. The North Country Mule was still the most numerous crossbred ewe with about 2 million ewes mated and accounted for 12.6% of the national ewe breeding population, though they have declined since the 1996 survey (23%).

Farm numbers reached their lowest for a long time with about 52,500 farms registered with the British Wool Marketing Board, a loss of about 30% of farms with breeding sheep since the last survey (1996). In addition to a lower number of farms, flock and sheep numbers have also declined.

The North Country Mule was still the most widely used type of ewe in Britain, being found on 20% (10,531 farms) of all farms, this was followed by the Texel (5,697 farms) and the Suffolk (5,030 farms).

There were 412,000 rams used in 2003. Texel rams were mated to the largest number of ewes (3.6 million), which represent 23% of ewes in Britain. Suffolk rams were mated to the next largest number of ewes (3.4 million), followed by Bluefaced Leicester (1.2 million).

The well-documented stratified crossbreeding structure of the British sheep industry still exists, with the numerically large hill sector (3.83 million ewes) providing about 1.24 million draft ewes for mating with the Longwool Crossing rams (mainly Bluefaced and Border Leicester). These crosses produced 3.63 million ewes for breeding with Terminal Sire rams to produce lambs for slaughter. About 0.89 million ewes were retained for breeding from this three-way cross, with a further million hill ewes mated directly to Terminal Sire rams for meat production. About 0.91 million ewes were bred pure in the lowlands and about 0.42 million of their offspring mated to Terminal Sire rams. A further 1.45 million ewes were retained from these first crosses to act as mothers of meat lambs. Almost 67% of the slaughter lamb population was produced by ewes with some hill breeding and 30% produced by ewes with terminal sire breeding. Only 13.5% of slaughter lambs were produced by ewes with neither hill nor terminal sire breeding. The terminal sire rams continued to dominate as the sires of the slaughter lamb population at 71%.



6

Over the last 30 years many changes have occurred in the breeding structure of the British sheep industry. The rise of crossbred ewe numbers, from 32% in 1971 to 50% in 2003 was most noticeable. The importation of many breeds from continental Europe was another feature of this period. Two imported breeds (Texel and Charollais), which were not found in the 1971 survey, have become very prominent in the industry. The Texel is now the most numerous ram breed in Britain and is the largest lowland purebred ewe breed. The Charollais is the fifth most numerous ram breed.



7

6 Photo supplied by – British Charollais Sheep Society Ltd

7 Photograph taken from the 9th edition of British Sheep – published by National Sheep Association. Permission – British Texel Sheep Society Ltd

2. Introduction

Sheep can be found in every county of Britain, with the exception of some metropolitan areas, and they play a key role in the agriculture of many such counties. Despite the regular collection of agricultural census data there is no systematic, comprehensive and quantitative description of the breeding structure of the sheep industry. From time to time organisations involved in sheep production require information of this type and arrange for the collection of the relevant data. This first happened in 1971 when the Meat and Livestock Commission (MLC) was defining its sheep improvement strategy (*MLC Sheep Scientific Study Group Report*). A sample of sheep producers in Britain was surveyed to find out the breeds of sheep that they kept, which rams they used and their flock size. Further such surveys were carried out in 1987 (published in MLC's booklet *Sheep in Britain*) and 1996 (in *MLC Sheep Yearbook 1998*).

Since the last breed survey was carried out, the British sheep industry has been under considerable strain from BSE-related pressures, foot-and-mouth disease and low levels of profitability. This report describes the results of the survey on the structure of the British sheep industry at mating in autumn 2003.

The Department for Environment, Food and Rural Affairs' (Defra's) National Scrapie Plan (NSP) commissioned staff at the Wye campus of Imperial College London to undertake the survey and produce the report, and the Veterinary Laboratories Agency (VLA) were commissioned to edit the report.

This report summarises a more extensive report on the British sheep breeding industry. For more specific details please contact Dr Geoff Pollott⁸ directly.



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⁹ Photo supplied by – R.D.Eglin

3. Methodology

The information used in this report was collected using a single-page postal questionnaire (Appendix 1 – 2003 Sheep Breed Survey form) which was sent to a random sample of 60% of all wool producers in Great Britain during January 2004. These wool producers were registered with the British Wool Marketing Board (BWMB) in 2003. All persons owning four or more sheep are required to register with the BWMB.

Producers were asked to supply information on the breeds of ewe they kept, by age group, which ram breeds they used to mate these ewes, and whether the ewes and rams were homebred. Artificial insemination (AI) rams and those from performance recorded flocks were also noted, but will not be included in this report. Details of breeding stock sales, lamb sales and ewe lambs not mated were also collected. Additional data to help define the sheep production system was also collected.

The figures quoted in this report were derived from the 2003 Sheep Breed Survey, which was a sample survey from 24.5% of sheep keepers in Britain. All estimates fall within a range of likely values, which is determined by the statistical properties of the sample and population as a whole. For clarity of the text these ranges have been omitted from this publication but the fact that all estimates are subject to sampling error should not be forgotten. Thus for breed populations quoted at 1 million ewes the real value lies within $\pm 20,000$ and for breed populations of 5,000 and 100,000 the ranges are $\pm 1,500$ and $\pm 8,500$ respectively. Equivalent figures for breed populations of rams of 25,000 and 1,000 would be $\pm 1,750$ and ± 400 .



10

¹⁰ Photo supplied by – K. Boulton

4. Results

4.1 Response rate

Forms were sent out to 33,548 wool producers and 11,408 (34%) returned them. Table 1 compares the basic statistics of the current survey with those from the two previous surveys carried out in 1987 and 1996. The percentage of forms returned in 2003 (34%), which represented 20.9% of producers on the BWMB list, was greater than the previous surveys carried out in 1996 & 1987, (30.1% & 32.5% respectively). However, the percentage of useable forms returned has decreased, (72.2% in 2003 compared to 84.3% in 1996 & 86.6% in 1987). The percentage of useable forms has declined over the years, that is, between the 1987 and 1996 surveys the decline was 2.3% and between 1996 and 2003 the decline was 12.1%. Of this decline 9.6% was due to the unwillingness to provide the information or incomplete forms being returned. The remainder of the decline (2.5%) was due to forms being returned from respondents who no longer kept sheep. This resulted in a useable response rate of 24.5% of forms sent out, slightly lower than the two previous surveys.

Table 1. A summary of the number of forms sent out and returned from the 2003 Survey compared to the two previous surveys

	2003	1996	1987
Number of forms sent out	33,548	7,380	8,636
Number of forms returned	11,408	2,221	2,805
% returned	34.0	30.1	32.5
Useable forms	8,236	1,872	2,430
% returned & useable	72.2	84.3	86.6
% sent out & useable	24.5	25.4	28.1
Out of sheep	1,328	202	200*
% returned, out of sheep	11.6	9.1	7.1
% sent out, out of sheep	4.0	2.7	2.3
Unwilling, incomplete etc.	1,844	147	175*
% returned unwilling, incomplete etc.	16.2	6.6	6.2
% sent out unwilling, incomplete etc.	5.5	2.0	2.0
Total % returned unusable	27.8	15.7	13.4
Total % sent out unusable	9.5	4.7	4.3

**The exact values are not available but 375 of the returned forms were unusable*

4.2 Total sheep

Sheep numbers, from December Census data, appear to have risen consistently from the 1970s to the late eighties and then dropped back since the 1987 Survey (Table 2). This is somewhat misleading as Figure 1 shows. Sheep numbers actually peaked in 1987 and again in 1998 (18.8 million breeding ewes); the greatest changes taking place in England with more static numbers in Wales and Scotland during the late 1980s.

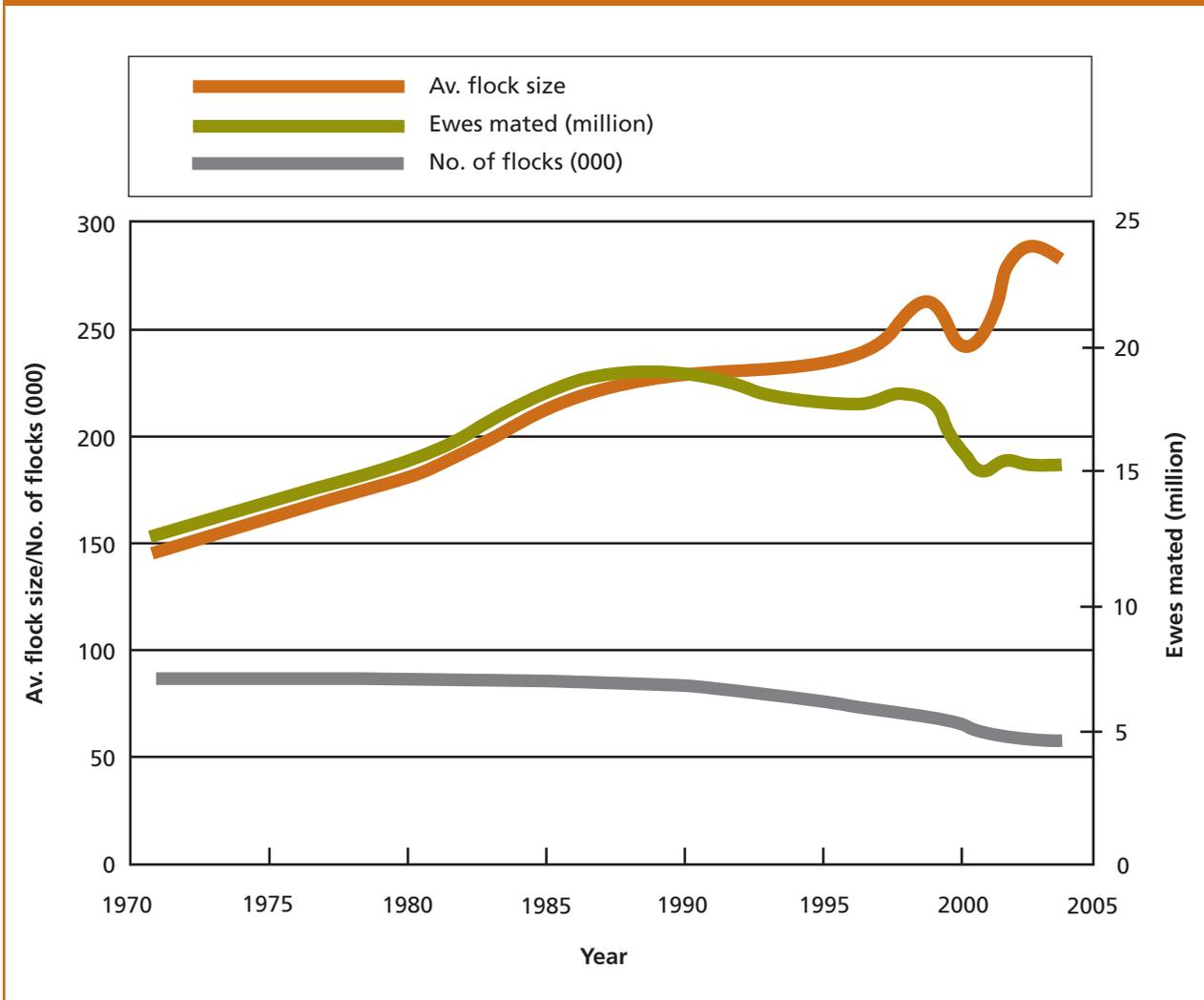
Table 2. Breeding sheep numbers from 1971 to 2003 from December Census* data (000).

	1971	1987	1996	2003
Ewes mated	11,952	17,375	16,860	14,377
Ewe lambs mated	unavailable	1,763	1,194	812
Total ewes mated	unavailable	19,138	18,054	15,189
Ewe lambs not mated	2,435**	2,103	2,528	2,476
Rams used	325	487	471	412
<i>**All ewe lambs</i>				

*Originally collected by the Ministry of Agriculture, Fisheries and Food (MAFF) now jointly by the Department for Environment, Food and Rural Affairs, Scottish Executive Environment and Rural Affairs Department and the Welsh Assembly Government.

Chapter 4

Figure 1. The annual number of breeding ewes mated, average flock size & number of flocks between 1970 and 2005 (December Census)



There appears to be a large decrease in ewe numbers prior to the 2001 foot-and-mouth epidemic, probably due to falling sheep profitability at the turn of the millennium.

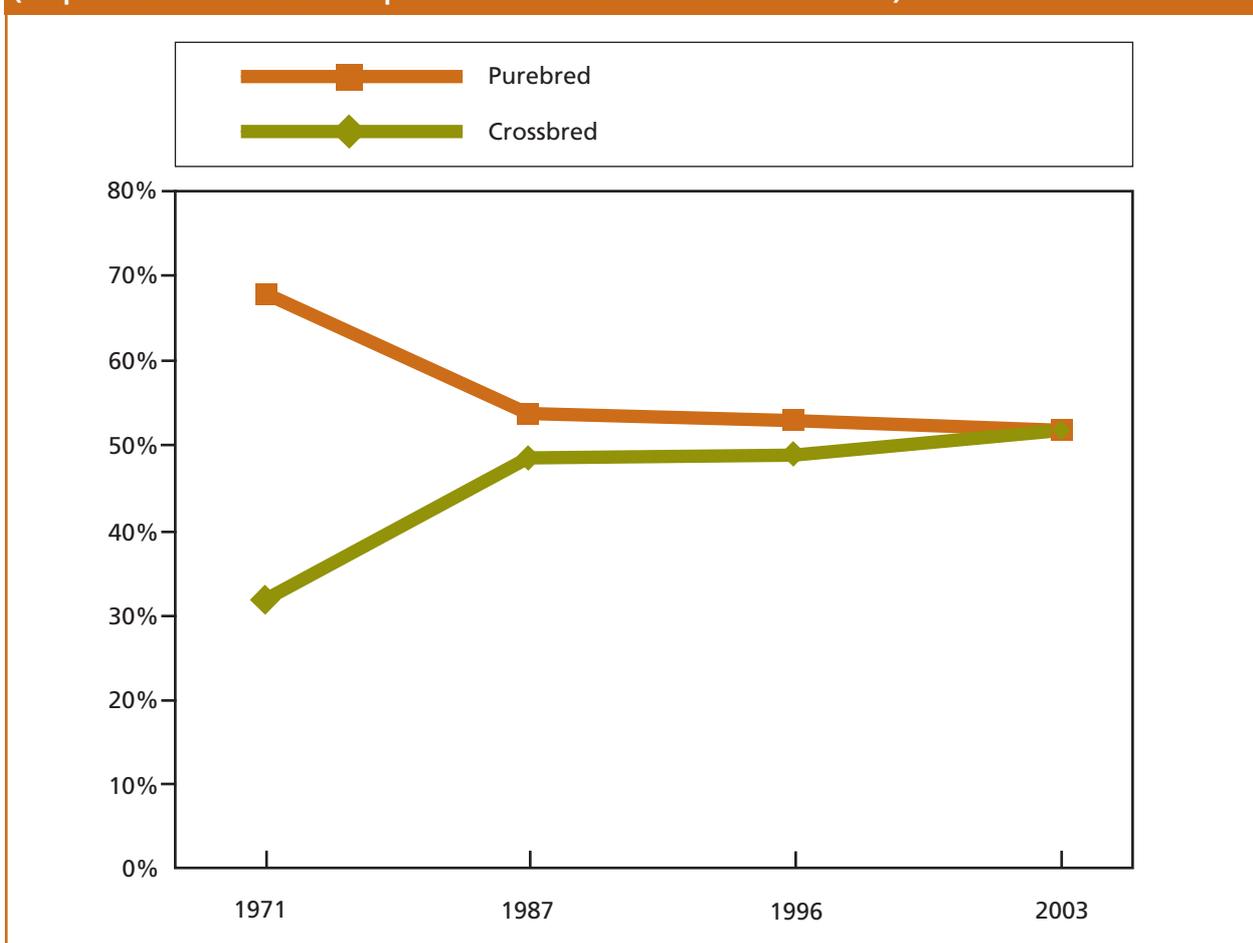
4.3 Pure breeds of ewe

The structure of the British sheep industry has been described as a stratified cross-breeding structure involving the systematic crossing of purebred, F₁ and three-way cross ewes with specific ram breeds to produce stock for breeding or meat production. Data from the 2003 survey (Table 3) shows the move towards a more crossbred population with 50% of the ewes in Britain now being under this category.

Table 3. Proportion of crossbred and purebred ewes in the national flock (%)

2003 survey	Purebred	Crossbred
Ewe lambs mated	30	70
Ewe lambs not mated	58	42
All ewes (2003 survey)	50	50
All ewes (1996 survey)	52	48
All ewes (1987 survey)	53	47
All ewes (1971 survey)	68	32

**Figure 2. An illustration of the table above
(Proportion of crossbred and purebred ewes in the national flock – %)**



Chapter 4

Combined with the overall drop in breeding ewe numbers outlined above, the number of purebred ewes mated has fallen from 9.75 million in 1996 to 7.69 million in 2003. The numbers of ewes in the major breeds are shown in Table 4. In all some 90 breeds of ewe were recorded in this survey, a full list of which is shown in Appendix 2.

Table 4. The main pure breeds of ewe kept in Britain

Breed	Breed Type **	No. ewes mated (000)	All ewes (000)	% of National Flock (2003)	% of National Flock (1996)	% Change of National Flock (1996–2003)
Scottish Blackface	H	1,686	2,033	11.10	16.36	-5.3
Welsh Mountain	H	1,563	1,861	10.29	7.42	2.9
Swaledale	H	1,047	1,247	6.89	8.12	-1.2
Beulah	H	498	571	3.28	5.37	-2.1
North Country Cheviot	H	435	531	2.87	2.93	-0.1
Texel	TS	326	392	2.15	1.11	1.0
Hardy Speckleface	H	276	321	1.82	0.43	1.4
Lleyn	SC	237	290	1.56	0.48	1.1
Suffolk	TS	230	259	1.51	2.05	-0.5
Romney Marsh	SC	165	196	1.09	0.88	0.2
Cheviot unspecified	H	147	172	0.97	1.40	-0.4
South Country Cheviot	H	94	115	0.62	0.45	0.2
Poll Dorset	SC	94	110	0.62	0.44	0.2
Brecon Hill Cheviot	H	73	88	0.48	0.18	0.3
South Welsh Mountain	H	59	71	0.39	0.02	0.4
Herdwick	H	55	68	0.36	0.28	0.1
Roughfell	H	46	55	0.30	0.52	-0.2
Charollais	TS	45	52	0.29	0.28	0.0
Other pure breeds*		514	752	3.41%	3.44%	
Purebred Totals		7,690	9,184	50%	52%	
Crossbred Totals		7,459	8,761	50%	48%	
TOTALS		15,149	17,945	100%	100%	

* Pure breeds with less than 50,000 ewes. See Appendix 2 for a complete list.

**H=Hill, TS=Terminal Sire, SC=Self-Contained

Pure ewe breeds account for 50% of the National Flock in 2003 & 52% in 1996.

In addition to the hill, terminal sire & longwool crossing sectors, a further category consists of 'self-contained' breeds. Previously these breeds have been categorised as longwool ewe and shortwool ewe, but over the years these definitions have become out dated and obsolete. Therefore, for the purpose of this report we have re-categorised them using the new term 'self-contained'. These breeds, are generally managed in self-contained flocks and historically, have developed in areas where there are less severe extremes of rough terrain and difficult climate than are experienced by the hill breeds.¹¹

¹¹ Eglin, R.D., Warner, R., Gubbins, S., Sivam, S.K., & Dawson, M., (2005) Frequencies of PrP genotypes in 38 breeds of sheep sampled in the National Scrapie Plan for Great Britain. *Veterinary Record* 156, 433–437

Main findings

Caution is required when noting the percentages quoted, as they may seem very large increases or decreases, and therefore be misleading. For example, a breed might have an increase of 120% but this may only involve an increase of 20,000 ewes and therefore, represent a very small proportion of the National Flock.

Also, due to the overall decline in sheep numbers, some breeds may have decreased in numbers but increased their proportion/contribution of the National Sheep Flock.

Main Pure Ewe Breeds

There are 18 main pure breeds with more than 50,000 ewes, accounting for 93% of the purebred ewe population and 47% of the National Flock. This is the same number of main pure breeds as reported in the 1996 survey, although this does not comprise exactly the same breeds.

The Brecon Hill Cheviot and South Welsh Mountain have increased in numbers and therefore moved into this category, whilst two traditional breeds, the Dalesbred and the Derbyshire Gritstone, previously in this category, now have less than 50,000 ewes, (47,000 and 42,000 respectively). The Dalesbred has declined in numbers by over 143,000 ewes (75%), whilst the Derbyshire Gritstone has declined by 23,000 ewes (35%).

Hill breeds account for 85% of the main pure ewe breeds, a reduction of 5% from the 1996 survey, whilst the other two breed types have increased; most notable is the self-contained group, which has increased by 3%.

Main Pure Ewe – Hill Breeds

Welsh hill breeds have increased in numbers, except for the Beulah breed, which has decreased by 46%. The largest increase comes from the South Welsh Mountain (1328%), whilst this figure seems very large the proportion of the National Flock it represents is only 0.4%, 71,000 ewes. The English and Scottish hill breeds have all decreased with the exception of the Herdwick breed, which has increased by 14%. Among this group, the most common breed in the UK, Scottish Blackface, suffered the biggest decrease (44%).



12

Main Pure Ewe – Terminal Sire Breeds

The 1996 survey showed three main terminal sire breeds; the most common being the Suffolk followed by the Texel and the Charollais. The 2003 survey shows a decline in both the Suffolk (36%) and the Charollais (10%), and the increase of the Texel by 72%, making it the most numerous pure breed ewe in the terminal sire section.

¹² Photograph taken from the 9th edition of British Sheep – published by National Sheep Association.
Permission – Herdwick Sheep Breeders Association

Chapter 4

Main Pure Ewe – Self-Contained Breeds

All three breeds in this group have increased in numbers, most notably the Lleyn (179%), which represents an increase of 133,000 ewes, Poll Dorset (27%), with an increase of 23,000 ewes and Romney Marsh (8%), with an increase of 15,000 ewes.



13

Other Pure Ewe Breeds (having less than 50,000 but more than 1,000 ewes)

There are 59 breeds recorded in this category, 13 more than the 1996 survey reported. Most of these additional breeds are either continental imports, or composites of existing breeds developed for improved commercial characteristics. An example of this would be the development of the Improved Welsh Breed, possibly resulting in the decline of the Hill Radnor, which has decreased by 93% (32,410 ewes).

Longwool Crossing Breeds

The main two traditional breeds in this section, Bluefaced Leicester and Border Leicester, have both declined 8% and 56% respectively.

Imported Breeds

Two French breeds imported during the 1970s and 1980s have also dropped in numbers, the Bleu du Maine (74%) and the Vendéen (27%). However, the Beltex, a continental breed not reported within the purebred ewe population in the 1996 survey now has over 7,000 ewes.



14

Other Pure Ewe Breeds (having less than 1,000 ewes)

There are 15 breeds reported as having less than 1,000 ewes, six of which are listed on the Rare Breeds Survival List. The other nine breeds are either imported or composites of foreign breeds.

¹³ Photograph taken from the 9th edition of British Sheep – published by National Sheep Association. Permission – Romney Sheep Breeders Society

¹⁴ Photo supplied by – British Bleu du Maine Sheep Society.

4.4 Crossbred ewe populations

Crossbred ewes can be categorized in a number of ways; recognised crosses e.g. Greyface (Border Leicester x Scottish Blackface) and crosses involving a range of breed combinations. Table 5 shows estimates of the ewe numbers in the various identifiable crossbred types.

Table 5. Estimated size of crossbred ewe populations

Type of Cross	No. ewes mated (000)	All ewes (000)	% National Flock (2003)	% National Flock (1996)	% Change of National Flock (1996–2003)
Longwool Crosses					
North Country Mule	1,915	2,188	12.6	23	-10.4
Welsh Mule	738	881	4.9	3	1.9
Scotch Mule	610	683	4.0	1	3.0
Greyface	212	230	1.4	1	0.5
Welsh Halfbred	130	151	0.9	1	-0.5
Scottish Halfbred	100	114	0.7	1	-0.2
Bluefaced Leicester crosses	81	96	0.5	<1	#
Beulah Mule	59	74	0.4	<1	#
Border Leicester crosses	40	45	0.3	<1	#
	3,885	4,462	25.7	30	-4.4
F1 Hill Breed Crosses					
Hill x Hill	239	289	1.6	1	0.6
Texel x Hill	92	111	0.6	#	#
Suffolk x Hill	81	97	0.5	1	-0.5
Lleyn x Hill	14	19	0.1	#	#
Charollais x Hill	9	11	0.1	#	#
Subtotals	435	527	2.9	2	0.9
Terminal Sire Crosses					
Suffolk x	1,289	1,549	8.5	7	1.5
Texel x	1,027	1,221	6.7	4	2.7
Charollais x	120	144	0.8	<1	#
Beltex x	22	35	0.1	#	#
Subtotals	2,458	2,949	16.1	11	4.2
Self Contained Crosses					
Lleyn crosses	69	83	0.4	#	#
Subtotals	69	83	0.4	0	0.4
All other Crosses	614	740	4.0	4	0.0
Totals	7,461	8,761	49.1	47	1.1
<i>Totals are lower than predicted due to rounding error, i.e. 49.1% should be 48%</i>					

Main findings

North Country Mules (Bluefaced Leicester x Swaledale or Scottish Blackface) was still the most common crossbred ewe type/breed, comprising 12.6% of the national breeding ewe population, though they have declined since the 1996 survey (23%).

Overall the longwool crosses, have declined with the consequent increase in the terminal sire, the hill breed and the self-contained crosses.

4.5 Ewe flocks

The results already presented for the numbers of breeding ewes in Britain show a decline over recent years. This was matched by a decline in the number of farms with breeding flocks. The 1996 survey was based on about 73,800 farms with breeding sheep (registered with the BWMB), but this was reduced to about 52,500 (registered with the BWMB) by mating 2003. This represents a loss of some 30% of farms with breeding sheep over this 7 year period. Of the 52,500 farms, 29,800 were in England (57%), 10,200 in Scotland (19%), and 12,400 in Wales (24%).

Table 6. Details of flocks containing ewes of the major* breeds and crossbreeds.

Breed	No. Flocks 2003	No. Flocks 1996	% Change in No. Flocks between 1996–2003	Change in No. Flocks between 1996–2003	Av. flock size (breeding ewes) 2003	Av. flock size (breeding ewes) 1996
North Country Mule	10,531	35,200	-70.1	-24669	182	134
Texel	5,697	8,500	-33.0	-2803	57	27
Suffolk	5,030	13,500	-62.7	-8470	46	31
Scottish Blackface	4,881	11,900	-59.0	-7019	345	285
Welsh Mountain	4,073	7,500	-45.7	-3427	384	204
All Cheviots**	3,914	6,900	-43.3	-2986	191	143
Welsh Mule	3,463	2,800	23.7	663	213	121
Swaledale	3,147	8,100	-61.1	-4953	333	208
Scotch Mule	2,525	1,500	68.3	1025	238	195
Lleyn	2,203	1,900	15.9	303	108	51
Beulah	2,126	6,400	-66.8	-4274	234	174
Bluefaced Leicester	1,393	2,500	-44.3	-1107	17	13
Charollais	1,294	2,300	-43.7	-1006	35	25
Jacob	1,154	2,300	-49.8	-1146	13	9
Greyface	981	1,700	-42.3	-719	217	102

Continued

Table 6. Details of flocks containing ewes of the major* breeds and crossbreeds.

Breed	No. Flocks 2003	No. Flocks 1996	% Change in No. Flocks between 1996–2003	Change in No. Flocks between 1996–2003	Av. flock size (breeding ewes) 2003	Av. flock size (breeding ewes) 1996
Poll Dorset	970	2,000	-51.5	-1030	97	45
Scottish Halfbred	948	2,300	-58.8	-1352	105	79
Welsh Halfbred	863	2,200	-60.8	-1337	150	128
Masham	814	3,200	-74.6	-2386	69	57
Hardy Speckledface	765	400	91.3	365	361	244
Shetland	552	1,300	-57.5	-748	68	23
Romney Marsh	540	1,000	-46.0	-460	307	187

* See Appendix 3 for a complete table. (Breeds with less than 500 flocks)

** All Cheviots, includes North Country Cheviot, South Country Cheviot, Cheviot unspecified and Brecon Hill Cheviots. See Appendix 3 for each type of Cheviot figures.

The North Country Mule was the most widely used type of ewe in Britain, being found on 20% of all farms with breeding sheep, though as the numbers of North Country Mules have declined the number of flocks has also declined, a loss of over 24,500. Texel and Suffolk ewes were the next most numerous breeds found on 11% and 9.6% of farms respectively. The Hill breeds and the Bluefaced Leicester crosses were the next most common breeds with the Lleyn breed now found on about 2,200 farms. The Jacob and Bluefaced Leicester breeds were characterized by widespread use but in small flocks, of 13 and 17 ewes respectively.



15

A total of 101 breeds were reported on farms in 2003. In considering the number of breeds that are found on more than 500 farms, 39 were recorded in 1996, and 23 in 2003, of which 26 (67%) and 17 (74%) respectively were purebred. There was a decline of 59% in the number of breeds over the 7 year period. In considering breeds found on over 100 but less than 500 farms, the figures for 1996 and 2003 were 14 and 39.



16

The reduction in the number of farms with breeding flocks over recent years has meant that a large number of breeds are now found on a small number of farms. Breeds found on less than 500 farms are listed in Appendix 3. Many of these breeds are imported breeds, which have either failed to gain a strong foothold in Britain over the years, or are recent imports, which may yet become more widespread. Other breeds are British breeds, which are becoming rarer as they no longer meet modern market requirements. The Clun Forest is an example of a breed that was once widespread but has now diminished considerably in numbers.

¹⁵ Photograph taken from the 9th edition of British Sheep – published by National Sheep Association. Permission – North of England Mule Sheep Association

¹⁶ Photo supplied by – Clun Forest Sheep Breeders Society Ltd.

5. Breeding rams

5.1 Ram breeds

There were 412,000 rams mated to 15.2 million ewes in 2003 (December 2003 Census data); a ewe to ram ratio of 37:1. The most numerous ram breeds are shown in Table 7. The three main Terminal Sire breeds in Britain had the largest ram populations with over 100,000 for Texel rams, nearly a quarter of all rams, being used on 21,500 flocks. Slightly fewer Suffolk rams (93,900) were found on 19,800 farms with Charollais rams having about a third of the population of the other two major breeds. The fourth most numerous breed was the Bluefaced Leicester, which comprised 30,800 rams on 5,500 farms.

Amongst the other breeds there are some notable features. The Lleyn breed is now used on about 2,600 farms and comprises some 2% of all rams. Also the Beltex, a recently imported breed, is becoming widespread with 4,700 rams being found on 1,600 farms. Other formerly important breeds are decreasing in number, such as, the Rouge de l'Ouest and the Bleu du Maine, both declined to under a 1,000 rams. The Border Leicester, once the sire of many crossbred ewes, is now down to 3,000 rams on 800 farms.

Table 7. A summary of the main breeds* of rams (over 1,500) used at mating 2003

Breed	2003 No rams (000)	1996 No rams (000)	2003 No flocks (000)	1996 No flocks (000)	2003 % all rams	1996 % all rams	% Change of National Flock (1996–2003)
Texel	100.35	79.0	21.48	25.6	24.4	17	7.4
Suffolk	93.90	144.8	19.77	38.0	22.8	31	-8.2
Charollais	31.04	36.5	8.27	11.9	7.5	8	-0.5
Bluefaced Leicester	30.76	37.0	5.47	9.3	7.5	8	-0.5
Scottish Blackface	30.31	55.4	2.83	5.9	7.4	12	-4.6
Welsh Mountain	26.20	20.6	3.06	3.0	6.4	4	2.4
Swaledale	13.52	15.6	1.89	2.9	3.3	3	0.3
North Co. Cheviot	10.60	11.5	2.2	2.8	2.6	2	0.6
Lleyn	8.19	2.1	2.63	1.2	2.0	<1	#
Beulah	5.37	11.1	1.27	2.8	1.3	2	-0.7
Beltex	4.68	0.8	1.64	0.5	1.1	<1	#
Hardy Speckledface	3.53	#	0.52	#	0.9	#	#
Cheviot unspec.	3.44	7.0	1.05	1.9	0.8	1	-0.2
Poll Dorset	3.12	2.1	0.96	1.2	0.8	<1	#
Romney Marsh	3.00	2.0	0.35	0.3	0.7	<1	#
Border Leicester	2.98	4.9	0.75	1.5	0.7	1	-0.3
South Co. Cheviot	2.33	2.0	0.2	0.2	0.6	<1	#
Meatlinec	1.77	#	0.36	#	0.4	#	#
Brecon Hill Cheviot	1.57	0.4	0.21	0.0	0.4	<1	#

* See Appendix 4 for a complete table (breeds with under 1,500 rams).

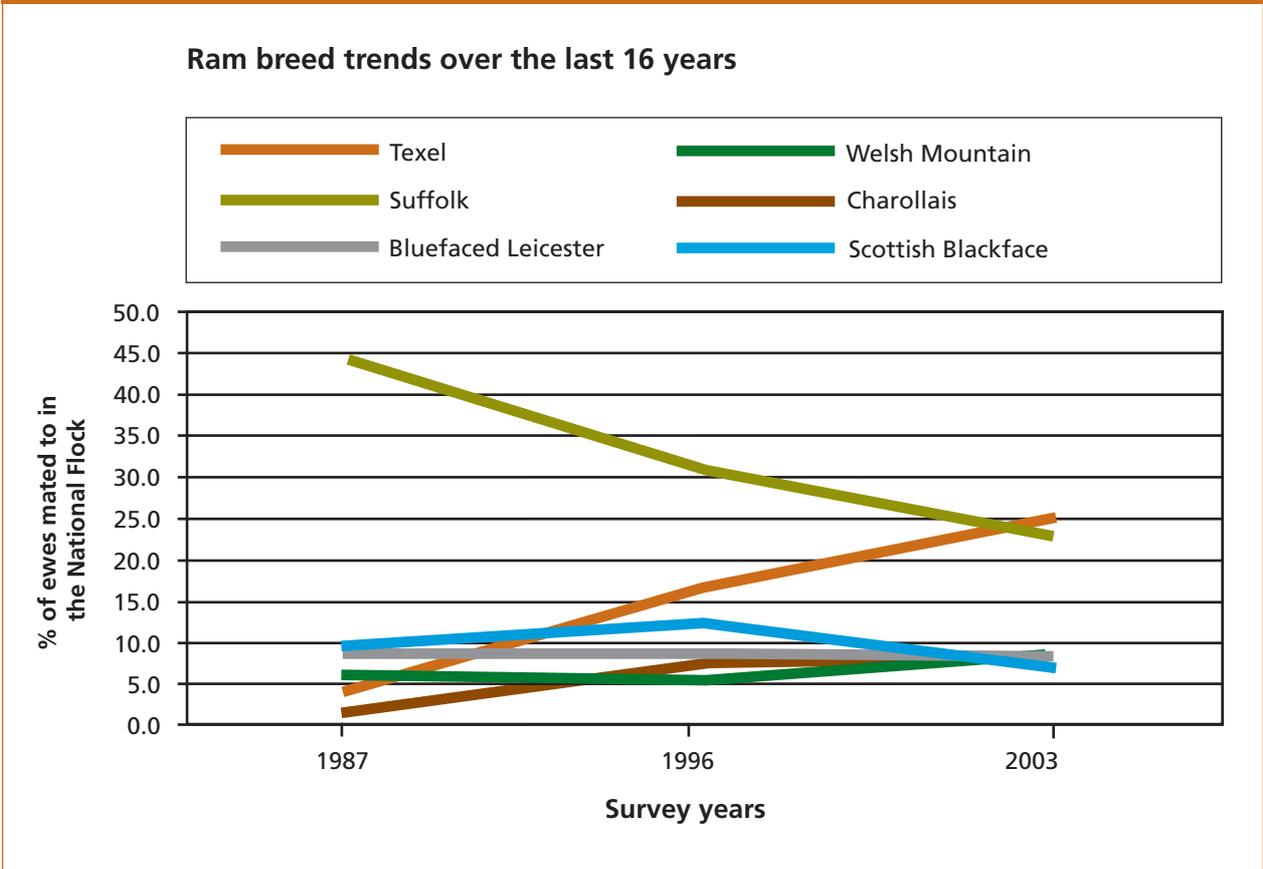
Ram breed use is shown in Table 8. Texel rams were mated to the largest number of ewes, over 3.6 million, which represented 23% of ewes in Britain. Suffolk rams were the next most widely used breed, being mated to over 21% of British ewes. These two breeds together account for nearly half the ewes in the country and reflect the important position of meat sires in the British sheep industry.

Table 8. Ram breed use in 2003 on both purebred and crossbred ewes

Ram Breeds	Ewes mated (000)	% of ewes mated to breed
Texel	3,614	23.0
Suffolk	3,393	21.6
Bluefaced Leicester	1,194	7.6
Welsh Mountain	1,152	7.3
Charollais	1,140	7.3
Scottish Blackface	1,118	7.1
Swaledale	579	3.7
North Co. Cheviot	376	2.4
Lleyn	324	2.1
Beulah	216	1.4
Beltex	164	1.0
Hardy Speckledface	156	1.0
Other Breeds	1,763	14.5
Totals	15,189	100%

Four breeds were mated to just over a million ewes each; two Hill breeds (Scottish Blackface and Welsh Mountain), another imported Terminal Sire breed (Charollais) and the Bluefaced Leicester. Other notable breeds found in Table 8 were the Lleyn, now mated to over 2% of ewes in the country and the Beltex, a recently imported breed mated to more than 1% of ewes.

Figure 3. Ram breed trends for the 6 main ram breeds, reported in the current and previous sheep surveys (1987, 1996, 2003)



6. Mating structure of the sheep industry

6.1 Pure breeding

The Roughfell breed shows the largest noticeable difference. In 2003 70% of Roughfells were mated pure compared to only 7% in 1996.

Table 9. The pure breeding sector of the British sheep industry

Breed	No. flocks (000)	Av. flock size	No. of Ewes mated pure (000)	% mated pure 2003	% mated pure 1996
Scottish Blackface	2.9	381	1,093	65	72
Welsh Mountain	2.9	378	1,086	69	67
Swaledale	1.9	296	558	53	48
North Co Cheviot	1.7	167	281	65	#
Texel	4.7	55	259	79	76
Belauh	1.0	188	180	36	51
Lleyn	1.6	104	169	71	74
Suffolk	3.5	43	149	65	58
Hardy Speckledface	0.5	296	145	53	#
Romney Marsh	0.3	288	91	55	45
South Co Cheviot	0.2	485	78	83	#
Cheviot unspec	0.6	127	77	52	#
Poll Dorset	0.7	91	66	70	57
Brecon Hill Cheviot	0.1	432	48	66	#
Herdwick	0.3	140	40	73	71
South Welsh Mtn	0.1	447	38	64	#
Lonk	0.0	1,117	35	81	#
Charollais	1.0	35	34	76	94
Roughfell	0.2	168	32	70	7
Badger Faced Welsh	0.3	81	27	73	#
Bluefaced Leicester	1.2	17	21	88	70
Dalesbred	0.1	166	17	41	53
Derbyshire Gritstone	0.2	72	16	43	45
Improved Welsh	0.1	209	14	34	#
Shetland	0.3	47	12	32	34
Jacob	0.7	14	10	67	63

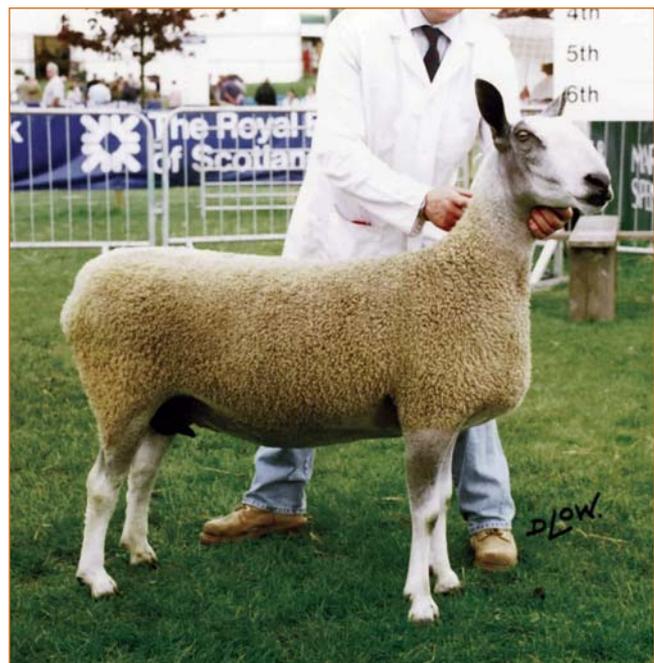
Data unavailable to compare.

6.2 Cross breeding

Cross breeding is a major feature of the British sheep industry. For many years this has been based on the regular production and sale of recognised crossbreeds of sheep, commonly based on mating older hill ewes (draft ewes) with Longwool rams. Ewe lambs or two-year-old ewes are sold from the upland farms where they are produced to other upland and lowland farms, where they are used as the mothers of slaughter lambs. Details of these crossbred-producing farms are shown in Table 10.

Table 10. Details of flocks producing recognised crossbreeds of ewe				
Hill breed	No. Flocks (000)	Av. flock size	No. Ewes (000)	% Ewes Homebred
Bluefaced Leicester crosses				
Swaledale	2.0	219	439	58
Scottish Blackface	1.6	217	356	47
Beulah	0.6	238	148	47
Welsh Mountain	0.6	154	87	52
Hardy Speckledface	0.1	142	19	76
Border Leicester crosses				
Welsh Mountain	0.2	224	51	66
North Co. Cheviot	0.1	233	28	21
Scottish Blackface	0.1	134	13	35
Other recognised crosses				
Masham	0.04	30	1.3	17

The Bluefaced Leicester crosses dominated the recognised crossbred sector, being produced on over 5,000 farms from over 1 million draft hill ewes. Swaledale and Scottish Blackface ewes were the major hill ewes crossed in this way, with about 2,000 flocks comprising about 400,000 ewes each. The three main Welsh hill breeds were also significant contributors to this sector. In all breeds the majority of ewes were homebred, indicating that in hill flocks the crossing of draft hill ewes to produce recognized crossbreeds was still an important source of income. However, there were a considerable number of ewes purchased for this purpose, probably reflecting the sale of draft hill ewes from harder hill farms to upland or lowland breeders.



17 Photo supplied by – Bluefaced Leicester Sheep Breeders Association.

Mating structure of the sheep industry

The Border Leicester crosses and Mashams were a much smaller part of the recognized crossbred market than the Bluefaced Leicester crosses. Only about 440 flocks were involved using 93,300 ewes in total.

In addition to the recognised crossbreds shown in Table 10, there were a considerable number of Terminal Sire cross ewes used in 2003. Table 5 indicates about 3 million of these ewes were sired by Terminal Sire breeds. A considerable proportion of them were purchased, with some 3,000 flocks selling 200,000 ewes of this type in 2003. The largest group of ewes was from a Terminal Sire crossed with the recognised Longwool x Hill crosses. However, a large number of other ewe breeds and crosses were also used.

6.3. Mating of purebred ewes

Hill ewe breeds dominated the purebreeding sector of the British sheep industry, with over 6 million ewes (Table 11). Nearly four million hill ewes were mated pure and a further 1.2 million crossed with Longwool rams to produce crossbred ewes for sale. A large number of hill ewes (958,000) were also mated directly with Terminal Sire breeds.



18

No other group of purebred ewes was particularly large. The Longwool crossing group comprised 40,000 ewes and the majority (82%) was bred to the same breed of ram. The Self-Contained category had 569,000 ewes, of which 66% were mated pure and 29% mated to Terminal Sire breeds. In the Terminal Sire breeds, comprising of 769,000 ewes, 65% were mated pure and 32% mated to other Terminal Sire breeds.

Table 11. A summary of the mating of purebred ewes

Ewe type	Ram type	Flocks (000)	Ewes (000)
Hill ewes	Bred pure	13.7	3,827
	Other hill	1.7	153
	LW crossing	6.3	1,240
	Terminal sire	9.4	958
	Other	1.3	96
	Total		6,274
Longwool crossing (LW)	Bred pure	1.8	33
	Terminal Sire	0.4	6
	Others	0.1	2
	Total		40
Self-contained*	Bred pure	4.6	376
	Terminal Sire	2.8	167
	Others	0.6	26
	Total		569
Terminal Sire (TS)	Bred pure	10.8	497
	Other Terminal Sire	6.8	245
	Others	1.3	28
	Total		769

* New category, as previously mentioned, replaces longwool ewe and shortwool ewe.

¹⁸ Photograph taken from the 9th edition of British Sheep – published by National Sheep Association. Permission – Blackface Sheep Breeders Association.

6.4 Mating of crossbred ewes

The mating of crossbred ewes in 2003 (Table 12) represents a complex pattern of breed combinations. The recognised Longwool x Hill breeds dominate the sector with 3.8 million ewes being mated, almost entirely to Terminal Sire breeds. These were split almost 50:50 between Texel and Suffolk rams but with a small number of other breeds being involved. A large number of ewe lambs from these crosses were kept back for breeding, just under 1 million ewes of this type being mated in 2003. These 3-way cross ewes were mated to Terminal Sire breed rams, the majority to Texels but Suffolks and the other Terminal Sire breeds were also used quite widely. A further 1.5 million Terminal Sire cross ewes were mated in 2003, to mainly Texel rams but also Suffolks and other Terminal Sire breeds in equal numbers. These ewes were from a wide range of maternal breeds and represent a considerable number of breeders keeping back their own replacements to use as breeding ewes. A further 220,000 ewes sired by Terminal Sire breeds directly from hill ewes were also mated in 2003. These were mated to Terminal Sires.



19

There were a quarter of a million Hill x Hill ewes mated in 2003, largely to Terminal Sire rams. A further 700,000 ewes from a wide variety of other crosses were also mated, once again mostly to Terminal Sire rams.

This complex crossbreeding structure can be characterised quite simply as follows. Hill ewe breeders attempt to maximize their income by adding value to their outputs. This takes the form of draft hill ewes being sold, or kept back, for further breeding, thus forming the basis for the Longwool x Hill breeding ewe. Alternatively they use Terminal Sire breeds, with good carcase characteristics and added size, to produce better lambs for slaughter (males) or for further breeding (females). Upland and lowland breeders purchase (or breed in some cases) the Longwool x Hill ewes as the mothers of slaughter lambs. These are F₁ ewes mated with Terminal Sire breeds to produce the right lamb for the market. However, many



20

breeders retain some of the ewe lambs from this cross for further breeding, once more mating them with Terminal Sire rams. This is a response to the price of replacements and the quality of the lamb produced for the abattoir. There are other breeds, outside the Hill, Longwool and Terminal Sire breeds, which are still maintained in certain parts of the country. Ewes from these breeds are also mated with Terminal Sire rams to produce the right lamb for the market and once more a proportion of the ewe lambs from this cross are retained for further breeding.

¹⁹ Photograph taken from the 9th edition of British Sheep – published by National Sheep Association. Permission – The Society of Border Leicester Sheep Breeders.

²⁰ Photograph taken from the 9th edition of British Sheep – published by National Sheep Association. Permission – Scotch Halfbred Sheep Breeders Association.

Chapter 6

This complex structure effectively uses different breeds in a variety of agroecological niches, to which they may be adapted, or uses the superior carcass characteristics of the Terminal Sire breeds to produce lamb for the market, of the right type. There is room for a range of breeds in this structure but the Hill, Terminal Sire and Longwool crossing breeds dominate, with many more traditional breeds being pushed out, largely because they are too small to produce slaughter lambs of the right weight and carcass quality.

Table 12. The mating of crossbred ewes

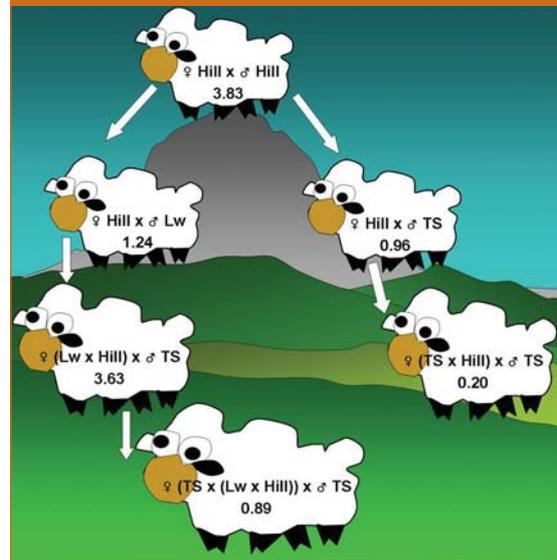
Crossbred ewe type	Ram breed	Farms (000)	Ewes (000)
Longwool x Hill	Texel	9.4	1,406
	Suffolk	10.3	1,782
	Other TS	4.0	445
	Others	2.1	188
	Total		3,820
Hill x Hill	Hill	0.5	79
	Terminal Sires	1.0	111
	Others	0.4	64
	Total		255
Terminal Sire (TS) x Hill	Terminal Sires	2.3	194
	Others	0.5	24
	Total		219
TS x (Longwool x Hill)	Texel	3.8	393
	Suffolk	2.9	225
	Other TS	2.5	272
	Others	0.9	57
	Total		946
Other TS crosses	Texel	7.6	723
	Suffolk	5.4	409
	Other TS	4.5	322
	Others	2.8	130
	Total		1,583
Other crosses	Texel	2.1	171
	Suffolk	2.2	196
	Other TS	1.6	102
	Others	3.5	242
	Total		711

7. Hill, upland and lowland ewe numbers

Sheep breeding and production in Britain is commonly described as a stratified crossbreeding structure. Whereas the outline structure in Figure 4 reflects this, to some extent, it does not give a clear picture of the stratification of the sheep industry since some of the breed/crossbreed groupings are found in more than one stratum. In order to investigate the split between lowland, upland and hill production the results of the survey were analysed by the type of Less-Favoured Area (LFA) category of the farms. This has become somewhat more complicated recently as the LFA scheme is interpreted differently in England, Wales and Scotland.

The only final product from the British sheep industry of any significance is lamb meat. Milk and wool are minor products, and store lambs, breeding stock and cull animals are intermediate products, although of significance to sheep keepers at various points in the crossing structure. Tables 13 and 14 show how the different breed groupings contributed to a range of measures of output from the British sheep industry.

Figure 4. Crossbreeding pattern of the major ewe types (million)



8. Contributions of the different breed types to measures of output

Table 13 shows how the different ewe breeds and crossbred types contributed as the mothers of slaughter lambs. The Longwool x Hill ewe types dominated this role, producing over 32% of lambs sold for meat. Purebred Hill ewes contributed a further 24% of the slaughter lambs; mainly male lambs not required for breeding and some surplus ewe lambs. These two groups together, producing over 55% of lambs for slaughter, highlight the mothering ability required of hill ewes and the significance of the higher level of fertility found in the Longwool Crossing breeds.

Table 13. Estimated proportion of the slaughter lamb crop born to different ewe types

Ewe type	% Of lamb Crop
Longwool crossing	0.5
Longwool x Hill	32.7
Hill ewes	23.9
Terminal Sires	5.4
TS x Hill	1.9
TS x (Longwool x Hill)	8.4
Other TS crosses	14.1
Other purebred ewes	4.9
Other crosses	8.2

Interestingly Terminal Sire breeds played a part in mothering another 30% of the lambs sold for slaughter. These breeds were not originally bred for their maternal ability but it is now clearly a key characteristic in the modern British breeding structure.



21

These features of breed contributions to maternal aspects of slaughter lamb production are restated in another way in Table 14. Here it can be seen that Hill breeds contributed nearly half the genes to the mothers of slaughter lambs. Longwool crossing breeds contributed about half that of Hill breeds, and Terminal Sire breeds contributed slightly less at 18%. The Self-Contained breeds play a minor role in this respect.

²¹ Photo supplied by – R.D. Eglin

Contributions of the different breed types to measures of output

Table 14. The proportional genetic contribution of the different breed types to different measures of output from the British sheep industry (%)

Breed type	Dams of Lambs	Sires of Lambs	Lambs Slaughtered	Lamb carcass Meat
Hill	48	16	31	27
Longwool crossing	22	6	14	15
Terminal Sire	18	71	44	47
Self-contained*	12	7	12	12

* New category, as previously mentioned, replaces longwool ewe and shortwool ewe.

The dominance of the Terminal Sire breeds as the sires of lambs born in Britain is also reflected in Table 14, siring 71% of them in total. The other major 'sire' breeds were the Hill breeds, which were responsible for 16% of lambs born.

The contribution of the breed types to the genetic makeup of lambs going for slaughter indicates that the Terminal Sire breeds comprised 44% of the genes of the lambs, with Hill breeds accounting for a further 31%. The Longwool Crossing breeds, through their contribution as the sires of crossbred mothers contributed 14% of the genes of slaughter lambs. These proportions were similar to those for lamb carcass meat but differed slightly due to the differential size of carcass between the different breed types.



22

²² Photo supplied by – Cheviot Sheep Society.

9. Lamb sales

The Defra June Census data for 2003 suggest that there were 17.34 million lambs in the UK. The lamb sales data from the survey are summarised in Table 15 to show the distribution of lamb sales between type of lamb, country and month of year.

Table 15. Lamb sales by country and type (000 head)

Country	Finished Lambs sold	Store Lambs sold	Ewe lambs Mated	Ewe lambs Not mated	Ewe lambs Sold	Ram lambs Sold	Total
England	6,183	1,670	245	901	374	34	9,408
Scotland	2,175	1,034	89	635	181	22	4,136
Wales	3,886	5,22	261	674	134	15	5,492
Total	12,244	3,225	596	2,210	690	71	19,035
% of total	64	17	3	12	4	0	

The data in Table 15 indicate a total of 19 million 2003-born lambs sold or retained. This estimate is higher than the June Census figure for a number of reasons. Firstly, the survey estimate includes lambs sold before June 2003; these lambs will not appear in the June Census data. Secondly, some of the ewe lambs sold may appear in the ewe lambs mated column, due to lambs being counted twice on their farm of sale and farm of purchase. Thirdly, some store lambs sales from the previous lamb crop may be counted in with the 2003 sales. Nevertheless, the data in Tables 15 and 16 give an interesting picture of how lambs were sold in 2003.

Table 16. The distribution of finished lamb sales by country and month of sale (000 head)

Country	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	On hand	Total
England	36	116	314	518	671	660	748	731	612	539	1,207	6,183
Scotland	9	8	21	66	164	272	330	317	286	231	457	2,175
Wales	5	29	127	261	377	428	539	578	521	446	563	3,886
Total	51	153	461	845	1,211	1,361	1,617	1,626	1,419	1,215	2,227	12,244
% of total	0	1	4	7	10	11	13	13	12	10	18	

The largest proportion of lambs were sold directly for meat as finished lambs (64% or 12.2 million) and a further 3.2 million (17%) were sold as store lambs, ultimately destined to become finished lambs too. About 15% of lambs were used as replacement ewes for the breeding flock.

Only a small proportion (5%) of finished lambs were prepared for the early-lamb market (March to May) when prices are traditionally higher than the rest of the year. There was an even distribution of lambs sold for meat from July through to December but the figures in Table 16 do not include the store lambs, which were finished in the latter part of the year. About 18% of lambs destined for finishing were still on farms at the end of 2003.

Lamb use by country differed. Whilst finished lamb sales were proportionately similar in all three countries, store lamb sales were more a feature of Scotland and England than Wales. The mating of ewe lambs was more prevalent in England and Wales whilst ram lamb sales were higher than expected in Scotland. Early lambing was a feature of English farms.



23

²³ Photo supplied by – Hampshire Down Sheep Breeders Association.

10. Concluding remarks

This report has described in detail the breeding structure of the British sheep industry during the 2003/4 production year. In addition, it has also been possible to look back over the last 30 years and describe the changes to sheep breeding that have occurred over that period.

There has been a decline in both ewe and farm/flock numbers over the last five years; however, the average flock size has continued to increase at a steady rate over the last 30 years, once the effects of the foot-and mouth epidemic are discounted and this indicates that it is the smaller flocks which are disappearing. Despite some dramatic influences on the sheep industry in recent years the stratified crossbreeding structure has survived and continues to evolve. This demonstrates both its utility and its ability to adapt to changing circumstances; it is a sustainable system, which provides income to all strata and results in a final product that is still in demand. The system is based on purebred hill ewes; hill flocks will continue to be a crucial resource and the presence of sheep in the hills will be essential to maintain a profitable sheep industry. The shift in ewe numbers from hill to upland and lowland will continue but a balance needs to be struck between the sectors.

In concluding this report, it would also be pertinent to look forward and suggest what may happen in the future, as an extension of the current situation. Sheep numbers will slowly increase as small flocks disappear and the move towards more efficient production leads to an increased average flock size. Farm/flock numbers will continue to fall as small and inefficient farms/flocks go out of business.

Producers have shown their ability to change breeds to suit market requirements and economic production systems. There has been a rise in efficient ewe breeds and crossbreeds (e.g. Mule types v Halfbred types; the Lleyn as a prolific ewe with relatively low bodyweight). There has been a decline in breeds producing over-fat lambs at market weights and a concomitant rise in breeds producing lean lamb, particularly at the top end of the weight range (e.g. Texel). This has without doubt been the result of the more widespread use of comparable information in the industry, i.e. performance recording, and to some extent the use of imported breeds and synthetics. There will undoubtedly be an increase in the number of breeds found in Britain as producers import more to try to find suitable genotypes for these purposes, and therefore the trend towards the widespread use of fewer breeds is also likely to continue, with this apparent paradox contributing to a rise in a number of breeds approaching extinction.

There will unquestionably be pressures on sheep producers towards more efficient production systems in order to make a profit. The reduction in subsidies with the change to EU area payments will be one driving force, while the introduction, or extension, of environmental payment schemes is unlikely to compensate for the loss of production subsidies. Thus there will be a move towards production methods that are more efficient than those of the past.

This move towards more economic flocks will favour more efficient ewes, healthier flocks, and producers who can capitalise on economies of scale while fully utilise the available resources in a sustainable manner.



24

²⁴ Photo supplied by – A. Murray & R.D. Eglin.

Glossary of terminology used within the report

Breeds	<p>A group of sheep with similar characteristics as recognised by either a breed society or sheep producers.</p> <p>Within this report, we have used what the respondent has called the breed, though due to geographical location, the names may vary slightly for the same breed, and therefore maybe listed more than once as a breed type.</p> <p>The Cheviots, are a classical example of this, as there are many different types of Cheviots, as some respondents did not define exactly which type of Cheviots they have, thus they are grouped as unspecified Cheviot.</p>
Farms	<p>For the purpose of this report, the term “farms” refers to the producer registered with the British Wool Marketing Board. Therefore, a farm may have more than one breed of sheep.</p>
Flocks	<p>For the purpose of this report, the term flock refers to a group of sheep categorised together usually on the same farm. In some instances it refers to a group of sheep of a given breed on a farm.</p>
F ₁ – generation	<p>A cross of two different pure breeds of sheep</p>
Three-way cross	<p>A cross between an F₁ and another breed, not one of the parental breeds of the F₁</p>
Pure breed	<p>For the purpose of this report, the term pure breed refers to a breed of sheep, which are recognised as pure, by either the National Sheep Association (NSA), a group of producers, or the National Scrapie Plan (NSP). They may also include foreign imports or composites of other breeds that over time have developed into a recognised breed.</p>
Halfbred	<p>The progeny of two different purebred breeds. Usually, a Hill breed crossed with a Longwool crossing breed to produce a hybrid.</p>

Appendix 1 – The survey form

Details of sheep breeding stock – mating autumn 2003

(Please detach and return this page in the envelope provided)

CONFIDENTIAL

Age class	Ewes put to ram		Rams used to mate ewes		How many ewes kept on LFA land?			Summary of rams used						
	Name of breed or cross	Number of ewes	Of which, how many homebred	Name of breed	Number of rams	Date of ram turnout	SDA	DA	Other LFA	Name of breed	Total number of rams	Home-bred	AI rams	Of which, how many Performance recorded
Ewe lambs														
Two-tooth ewes														
Ewes (older than two-tooth)														

Ewe lambs on the farm but NOT mated	
Name of breed or cross	Total number

Sheep sold for breeding				
2003 Born	2002 Born		Older (include draft ewes)	
	Breed	Number	Breed	Number
Rams				
Ewes				

Finished	Number of lambs sold from 2003 lamb crop by month of sale (Do NOT include purchased store lambs)												Lambs on hand at end of December	
	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec			
Store														

Hill flocks only
Do you keep a small group of ewes to produce rams for sale? YES NO

If YES, please give breed and number of ewes

Forage crops (please tick appropriate box)
Do you use forage crops to feed sheep? YES NO

Thank you for taking the time and trouble to complete this form.

Appendix 2

The main pure breeds of ewe kept in Britain.

Breed	No. Ewes mated (000)	All ewes (000)	% of National Flock (2003)	% of National Flock (1996)	% Change of National Flock (1996–2003)
Scottish Blackface	1685.87	2033.28	11.10	16.36	-5.26
Welsh Mountain	1563.12	1860.92	10.29	7.42	2.87
Swaledale	1046.50	1247.03	6.89	8.12	-1.23
Beulah	498.33	570.94	3.28	5.37	-2.09
North Co Cheviot	435.21	530.52	2.87	2.93	-0.06
Texel	326.37	391.74	2.15	1.11	1.04
Hardy Speckledface	275.97	321.18	1.82	0.43	1.39
Lleyn	237.41	290.28	1.56	0.48	1.08
Suffolk	229.56	258.92	1.51	2.05	-0.54
Romney Marsh	165.46	195.64	1.09	0.88	0.21
Cheviot unspec.	147.28	171.81	0.97	1.40	-0.43
South Co. Cheviot	94.26	115.14	0.62	0.45	0.17
Poll Dorset	94.24	110.18	0.62	0.44	0.18
Brecon Hill Cheviot	72.74	87.77	0.48	0.18	0.30
South Welsh Mountain	59.02	71.41	0.39	0.02	0.37
Herdwick	55.34	68.29	0.36	0.28	0.08
Roughfell	46.31	55.32	0.30	0.52	-0.22
Charollais	44.67	51.97	0.29	0.28	0.01
Lonk	43.22	47.56	0.28	0.17	0.11
Dalesbred	41.31	46.99	0.27	0.90	-0.63
Improved Welsh	41.23	44.57	0.27	n/a	n/a
Badger Faced Welsh	37.44	44.54	0.25	0.02	0.23
Shetland	37.29	45.11	0.25	0.14	0.11
Derbyshire Gritstone	36.66	42.05	0.24	0.30	-0.06
Glamorgan Welsh	24.97	29.35	0.16	n/a	n/a
Bluefaced Leicester	23.77	31.04	0.16	0.16	0.00
Exmoor Horn	19.42	23.31	0.13	0.13	0.00
Dorset Down	17.34	18.95	0.11	0.09	0.02
Whitefaced Welsh	16.86	20.46	0.11	0.02	0.09
Jacob	15.27	18.28	0.10	0.10	0.00
Kerryhill	13.34	13.94	0.09	0.01	0.08
Easycare	13.21	14.81	0.09	n/a	n/a
Hartline	13.15	15.19	0.09	n/a	n/a

Continued

Appendix 2

The main pure breeds of ewe kept in Britain.					
Breed	No. Ewes mated (000)	All ewes (000)	% of National Flock (2003)	% of National Flock (1996)	% Change of National Flock (1996–2003)
Dorset Horn	12.33	13.40	0.08	0.09	-0.01
Clun Forest	11.95	13.19	0.08	0.24	-0.16
Hampshire Down	8.03	9.17	0.05	0.01	0.04
Southdown	6.88	8.29	0.05	0.05	0.00
Devon Closewool	6.64	8.03	0.04	0.03	0.01
Rouge de la Ouest	6.56	7.50	0.04	0.06	-0.02
Whitefaced Woodland	6.33	7.34	0.04	0.02	0.02
Cambridge	6.33	6.66	0.04	0.13	-0.09
Beltex	6.24	7.74	0.04	0.00	0.04
Llanwenog	6.13	6.53	0.04	0.06	-0.02
Bleu de Maine	5.78	6.52	0.04	0.12	-0.08
Black Welsh Mountain	5.73	8.06	0.04	0.01	0.03
Border Leicester	5.37	6.67	0.04	0.07	-0.03
Whitefaced Dartmoor	5.27	5.93	0.03	0.03	0.00
Hebridean	5.25	6.21	0.03	0.02	0.01
Ryeland	5.13	6.07	0.03	0.02	0.01
Shropshire	4.14	4.72	0.03	0.01	0.02
Berrichon du Cher	4.11	4.39	0.03	0.02	0.01
Oxford Down	3.86	4.88	0.03	0.02	0.01
Greyfaced Dartmoor	3.70	4.50	0.02	0.02	0.00
Wiltshire Horn	3.39	3.92	0.02	0.02	0.00
Balwen	3.22	4.03	0.02	0.02	0.00
Friesland	2.88	3.18	0.02	0.05	-0.03
Wensleydale	2.79	3.52	0.02	0.00	0.02
Manx Lochtan	2.76	3.31	0.02	0.01	0.01
Vendean	2.53	2.93	0.02	0.01	0.01
Meatlinc	2.45	3.50	0.02	n/a	n/a
Lacaune	2.38	2.43	0.02	n/a	n/a
Radnor	2.11	2.59	0.01	0.16	-0.15
Nelson	2.09	2.09	0.01	n/a	n/a
Lincoln Longwool	2.04	2.46	0.01	0.01	0.00
Roussin	1.91	2.20	0.01	n/a	n/a
Dev. & Cornw. Longwool	1.89	2.43	0.01	0.02	-0.01
Cotswold	1.85	2.28	0.01	0.01	0.00

Continued

The main pure breeds of ewe kept in Britain.

Breed	No. Ewes mated (000)	All ewes (000)	% of National Flock (2003)	% of National Flock (1996)	% Change of National Flock (1996–2003)
Portland	1.78	2.23	0.01	0.01	0.00
Ile de France	1.59	1.76	0.01	0.00	0.01
Norfolk Horn	1.49	1.80	0.01	0.00	0.01
Charmoise	1.49	1.56	0.01	n/a	n/a
Colbred	1.40	1.40	0.01	0.00	0.01
Continental	1.33	1.33	0.01	n/a	n/a
Leicester	1.25	1.52	0.01	n/a	n/a
Zwartbles	1.25	1.45	0.01	0.01	0.00
INRA 401	1.04	1.15	0.01	n/a	n/a
Improved Dartmoor	1.00	1.00	0.01	0.00	0.01
Teeswater	0.93	1.09	0.01	0.01	0.00
Drysdale	0.67	0.67	0.00	n/a	n/a
British Milkshoop	0.51	0.51	0.00	n/a	n/a
Merino	0.50	0.59	0.00	n/a	n/a
Gotland	0.45	0.57	0.00	0.00	0.00
Soay	0.44	0.48	0.00	0.01	-0.01
North Ronaldsay	0.36	0.46	0.00	n/a	n/a
Saxon Merino	0.33	0.44	0.00	n/a	n/a
Galway	0.27	0.34	0.00	0.01	-0.01
Castlemilk Moorit	0.08	0.08	0.00	0.00	0.00
Boreray	0.06	0.07	0.00	n/a	n/a
Avranchin	0.06	0.06	0.00	n/a	n/a
British Icelandic	0.06	0.06	0.00	0.00	0.00
Polwarth	0.04	0.08	0.00	n/a	n/a
Corriedale	0.01	0.01	0.00	n/a	n/a

n/a = not reported in the previous survey

Appendix 3

Details of flocks containing ewes of different breeds and crossbreeds.

Breed	No. Flocks 2003	No. Flocks 1996	% Change in No. Flocks between 1996–2003	Change in No. Flocks between 1996–2003	Av. flock size (breeding ewes) 2003	Av. flock size (breeding ewes) 1996
North Country Mule	10531	35200	-70.1	-24669	182	134
Texel	5697	8500	-33.0	-2803	57	27
Suffolk	5030	13500	-62.7	-8470	46	31
Scottish Blackface	4881	11900	-59.0	-7019	345	285
Welsh Mountain	4073	7500	-45.7	-3427	384	204
Welsh Mule	3463	2800	23.7	663	213	121
Swaledale	3147	8100	-61.1	-4953	333	208
Scotch Mule	2525	1500	68.3	1025	238	195
North Co. Cheviot	2357	#	#	#	185	#
Lleyn	2203	1900	15.9	303	108	51
Beulah	2126	6400	-66.8	-4274	234	174
Bluefaced Leicester	1393	2500	-44.3	-1107	17	13
Charollais	1294	2300	-43.7	-1006	35	25
Jacob	1154	2300	-49.8	-1146	13	9
Cheviot unspec.	1115	#	#	#	132	#
Greyface	981	1700	-42.3	-719	217	102
Poll Dorset	970	2000	-51.5	-1030	97	45
Scottish Halfbred	948	2300	-58.8	-1352	105	79
Welsh Halfbred	863	2200	-60.8	-1337	150	128
Masham	814	3200	-74.6	-2386	69	57
Hardy Speckledface	765	400	91.3	365	361	244
Shetland	552	1300	-57.5	-748	68	23
Romney Marsh	540	1000	-46.0	-460	307	187
Herdwick	450	900	-50.0	-450	123	64
Ryeland	410	400	2.5	10	12	11
Badgerfaced Welsh	408	#	#	#	92	#
Southdown	389	500	-22.2	-111	18	19
Dorset Down	359	1000	-64.1	-641	48	18
Derbyshire Gritstone	318	1200	-73.5	-882	115	53
Black Welsh Mountain	280	#	#	#	20	#
Dalesbred	276	1200	-77.0	-924	150	152
Roughfell	251	600	-58.2	-349	184	175
Hampshire Down	242	400	-39.5	-158	33	6

Continued

Details of flocks containing ewes of different breeds and crossbreeds.

Breed	No. Flocks 2003	No. Flocks 1996	% Change in No. Flocks between 1996–2003	Change in No. Flocks between 1996–2003	Av. flock size (breeding ewes) 2003	Av. flock size (breeding ewes) 1996
Beltex	237	#	#	#	26	#
Kerryhill	237	#	#	#	56	#
Greyfaced Dartmoor	225	200	12.5	25	16	15
Brecon Hill Cheviot	221	#	#	#	329	#
South Co. Cheviot	221	#	#	#	427	#
Border Leicester	218	600	-63.7	-382	25	25
Clun Forest	215	900	-76.1	-685	56	54
Exmoor Horn	212	400	-47.0	-188	92	62
Dorset Horn	209	600	-65.2	-391	59	31
Beulah Mule	200	#	#	#	296	#
Wensleydale	190	#	#	#	15	#
Hebridean	181	#	#	#	29	#
Bleu de Maine	169	800	-78.9	-631	34	30
Llanwenog	152	300	-49.3	-148	40	41
Improved Welsh	151	#	#	#	274	#
Shropshire	148	#	#	#	28	#
Lincoln Longwool	138	#	#	#	15	#
Balwen	137	#	#	#	23	#
Zwartbles	132	#	#	#	9	#
Cotswold	126	#	#	#	15	#
Berrichon du Cher	125	#	#	#	33	#
Oxford Down	118	400	-70.5	-282	33	12
Teeswater	118	400	-70.5	-282	8	6
Wiltshire Horn	116	#	#	#	29	#
Portland	113	#	#	#	16	#
Manx Lochtan	110	#	#	#	25	#
Rouge de la Ouest	109	800	-86.4	-691	60	16
South Welsh Mountain	106	#	#	#	557	#
Whitefaced Woodland	101	200	-49.5	-99	63	18
Leicester	94	#	#	#	13	#
Lonk	93	300	-69.0	-207	464	107
Radnor	91	#	#	#	23	#
Soay	81	#	#	#	5	#

Continued

Appendix 3

Details of flocks containing ewes of different breeds and crossbreeds.						
Breed	No. Flocks 2003	No. Flocks 1996	% Change in No. Flocks between 1996–2003	Change in No. Flocks between 1996–2003	Av. flock size (breeding ewes) 2003	Av. flock size (breeding ewes) 1996
Dev. & Cornw. Longwool	75	#	#	#	25	#
Vendeen	71	#	#	#	36	#
Friesland	70	#	#	#	41	#
Norfolk Horn	70	#	#	#	21	#
Cambridge	68	300	-77.3	-232	93	91
Devon Closewool	68	#	#	#	98	#
Whiteface Welsh	68	#	#	#	249	#
Whitefaced Dartmoor	62	300	-79.3	-238	85	20
Ile de France	57	#	#	#	28	#
Roussin	51	#	#	#	38	#
Hartline	43	#	#	#	302	#
Glamorgan Welsh	37	#	#	#	677	#
North Ronaldsay	37	#	#	#	10	#
Easycare	29	#	#	#	452	#
Charmoise	29	#	#	#	51	#
Highland Mule	28	#	#	#	304	#
Galway	28	#	#	#	10	#
British Milkshoop	26	#	#	#	19	#
Gotland	24	#	#	#	19	#
Merino	18	#	#	#	27	#
Castlemilk Moorit	18	#	#	#	5	#
Continental	18	#	#	#	76	#
Nelson	15	#	#	#	136	#
Drysdale	14	#	#	#	48	#
Meatlinc	12	#	#	#	207	#
Colbred	6	#	#	#	226	#
INRA 401	6	#	#	#	168	#
Boreray	6	#	#	#	10	#
Saxon Merino	6	#	#	#	53	#
Avranchin	6	#	#	#	10	#
Corriedale	6	#	#	#	2	#
Lacaune	6	#	#	#	422	#
Improved Dartmoor	6	#	#	#	178	#
Polwarth	6	#	#	#	8	#
British Icelandic	6	#	#	#	10	#

= data unavailable

Appendix 4

The main breeds of ram used at mating 2003

Breed	2003 No rams (000)	1996 No rams (000)	2003 No flocks (000)	1996 No flocks (000)	2003 % all rams	1996 % all rams	% Change of National Flock (1996–2003)
Texel	100.35	79.0	21.48	25.6	24.4	17	7.4
Suffolk	93.90	144.8	19.77	38.0	22.8	31	-8.2
Charollais	31.04	36.5	8.27	11.9	7.5	8	-0.5
Bluefaced Leicester	30.76	37.0	5.47	9.3	7.5	8	-0.5
Scottish Blackface	30.31	55.4	2.83	5.9	7.4	12	-4.6
Welsh Mountain	26.20	20.6	3.06	3.0	6.4	4	2.4
Swaledale	13.52	15.6	1.89	2.9	3.3	3	0.3
North Co. Cheviot	10.60	11.5	2.2	2.8	2.6	2	0.6
Lleyn	8.19	2.1	2.63	1.2	2.0	<1	#
Beulah	5.37	11.1	1.27	2.8	1.3	2	-0.7
Beltex	4.68	0.8	1.64	0.5	1.1	<1	#
Hardy Speckledface	3.53	#	0.52	#	0.9	#	#
Cheviot unspec.	3.44	7.0	1.05	1.9	0.8	1	-0.2
Poll Dorset	3.12	2.1	0.96	1.2	0.8	<1	#
Romney Marsh	3.00	2.0	0.35	0.3	0.7	<1	#
Border Leicester	2.98	4.9	0.75	1.5	0.7	1	-0.3
South Co. Cheviot	2.33	2.0	0.2	0.2	0.6	<1	#
Meatlinc	1.77	#	0.36	#	0.4	#	#
Brecon Hill Cheviot	1.57	0.4	0.21	0.0	0.4	<1	#
Hampshire Down	1.34	0.6	0.4	0.4	0.3	<1	#
Derbyshire Gritstone	1.24	1.0	0.37	0.5	0.3	<1	#
Southdown	1.23	0.9	0.46	0.6	0.3	<1	#
South Welsh Mountain	1.22	#	0.09	#	0.3	#	#
Herdwick	1.14	1.8	0.27	0.5	0.3	<1	#
Jacob	1.03	1.2	0.67	1.1	0.3	<1	#
Berrichon du Cher	0.97	1.2	0.43	0.4	0.2	<1	#
Shetland	0.97	1.0	0.31	0.6	0.2	<1	#
Dorset Down	0.94	1.4	0.34	0.8	0.2	<1	#
Badger Faced Welsh	0.94	#	0.32	#	0.2	#	#
Rouge de la Ouest	0.89	3.2	0.37	1.9	0.2	1	-0.8
Roughfell	0.87	#	0.17	#	0.2	#	#
Ryeland	0.75	0.4	0.41	0.5	0.2	<1	#

Continued

Appendix 4

The main breeds of ram used at mating 2003							
Breed	2003 No rams (000)	2003 No flocks (000)	2003 No flocks (000)	1996 No flocks (000)	2003 % all rams	1996 % all rams	% Change of National Flock (1996–2003)
Oxford Down	0.70	0.8	0.2	0.5	0.2	<1	#
Lonk	0.68	#	0.05	#	0.2	#	#
Teeswater	0.68	2.7	0.21	0.9	0.2	1	-0.8
Vendean	0.68	0.6	0.22	0.2	0.2	<1	#
Easycare	0.63	#	0.04	#	0.2	#	#
Bleu de Maine	0.60	2.9	0.25	1.6	0.2	1	-0.9
Dalesbred	0.54	1.5	0.12	0.4	0.1	<1	#
Clun Forest	0.53	0.7	0.15	0.4	0.1	<1	#
Shropshire	0.40	#	0.18	#	0.1	#	#
Wiltshire Horn	0.40	#	0.15	#	0.1	#	#
Glamorgan Welsh	0.37	#	0.04	#	0.1	#	#
Wensleydale	0.37	#	0.17	#	0.1	#	#
Dorset Horn	0.34	0.6	0.15	0.5	0.1	<1	#
Kerryhill	0.33	#	0.2	#	0.1	#	#
Exmoor Horn	0.31	0.5	0.12	0.2	0.1	<1	#
Black Welsh Mountain	0.30	#	0.15	#	0.1	#	#
Llanwenog	0.29	#	0.12	#	0.1	#	#
Improved Welsh	0.28	#	0.07	#	0.1	#	#
Greyfaced Dartmoor	0.27	#	0.15	#	0.1	#	#
Leicester	0.27	#	0.08	#	0.1	#	#
Roussin	0.26	#	0.11	#	0.1	#	#
Norfolk Horn	0.23	#	0.07	#	0.1	#	#
Whitefaced Woodland	0.22	#	0.09	#	0.1	#	#
Ile de France	0.22	0.4	0.07	0.3	0.1	<1	#
Cotswold	0.21	#	0.11	#	0.1	#	#
Cambridge	0.21	0.4	0.12	0.2	0.1	<1	#
Hebridean	0.21	#	0.11	#	0.1	#	#
Zwartbles	0.19	#	0.13	#	0.1	#	#
Whitefaced Welsh	0.18	#	0.05	#	0.0	#	#
Hartline	0.17	#	0.03	#	0.0	#	#
Portland	0.17	#	0.1	#	0.0	#	#
Lincoln Longwool	0.16	#	0.1	#	0.0	#	#

Continued

The main breeds of ram used at mating 2003

Breed	2003 No rams (000)	2003 No flocks (000)	2003 No flocks (000)	1996 No flocks (000)	2003 % all rams	1996 % all rams	% Change of National Flock (1996–2003)
Dev. & Cornw. Longwool	0.15	#	0.07	#	0.0	#	#
Devon Closewool	0.13	#	0.05	#	0.0	#	#
Colbred	0.12	#	0.02	#	0.0	#	#
Orkney	0.11	#	0.01	#	0.0	#	#
Balwen	0.11	#	0.1	#	0.0	#	#
Radnor	0.11	0.6	0.06	0.1	0.0	<1	#
Whitefaced Dartmoor	0.09	#	0.05	#	0.0	#	#
Manx Lochtan	0.09	#	0.05	#	0.0	#	#
Charmoise	0.08	#	0.03	#	0.0	#	#
Merino	0.06	#	0.04	#	0.0	#	#
British Milkshoop	0.06	#	0.02	#	0.0	#	#
INRA 401	0.05	#	0.02	#	0.0	#	#
Galway	0.04	#	0.03	#	0.0	#	#
Friesland	0.04	#	0.03	#	0.0	#	#
Gotland	0.03	#	0.01	#	0.0	#	#
Saxon Merino	0.03	#	0.01	#	0.0	#	#
Lacaune	0.02	#	0.01	#	0.0	#	#
Improved Dartmoor	0.02	#	0.01	#	0.0	#	#
North Ronaldsay	0.02	#	0.02	#	0.0	#	#
Soay	0.01	0.4	0.01	0.1	0.0	<1	#
Castlemilk Moorit	0.01	#	0.01	#	0.0	#	#
Meatline	0.01		0.01		0.0		0.0
St Kilda	0.01	#	0.01	#	0.0	#	#
Polwarth	0.01	#	0.01	#	0.0	#	#
Drysdale	0.01	#	0.01	#	0.0	#	#
Nelson	0.01		0.01		0.0		0.0
Boreray	0.01	#	0.01	#	0.0	#	#
Corriedale	0.01	#	0.01	#	0.0	#	#
British Icelandic	0.01	#	0.01	#	0.0	#	#

= data unavailable

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