

Table 45. Grazing periods, availability of lay-back land, transfer of stock to lay-back land and removal of stock in severe weather for various cattle breeds; numbers refer to months (e.g. 3-12 = March to December; 5-2 = May to February; 1-12 = all year etc.). Numbers in brackets indicate frequency with which that period was recorded if greater than one.

Breed or Cross	Grazing Periods	Lay-back Available	Stock Transferred	Stock Removed
Aberdeen Angus	1-12, 4-11		12-2	11
Aberdeen Angus x Friesian	4-12			4+12
Aubrac x Galloway	1-12			
Beef Shorthorn	5-10			
Beef Shorthorn x	1-12, 5-10, 7-10, 9-12, 10-12			10
Beef Shorthorn x Hereford	3-9	9	9-5	
Beef Shorthorn x Jersey x Longhorn	3-9	9	9-5	
Beef Shorthorn x British White x Friesian x Hereford	3-9	9	9-5	
Beef Shorthorn x British White x Friesian	3-9	9	9-5	
Belgian Blue	5-11			
Belgian Blue x	4-12		12-2	4+12, 11
"Black" Hereford	5-10		11-3	
Blonde d'Aquitaine	5-11			
Blonde d'Aquitaine x	4-12		12-2	4+12, 11
British White	1-12, 5-10, 6-3, 10-5		4-5, 11-3	
British White x	10-5			
British White x Friesian	3-9	9	9-5	
British White x Friesian x Hereford	3-9	9	9-5	
Charolais	4-11, 5-11			
Charolais x	5-10		12-2	11
Charolais x Friesian	4-12			4+12
Charolais x Simmental	4-10			
"Continental" x	4-11, 5-11			
Devon	4-12, 6-3, 11-12		4-5	4+12
Devon x	8-12			

Breed or Cross	Grazing Periods	Lay-back Available	Stock Transferred	Stock Removed
Dexter	1-12			
Friesian	1-12, 4-11, 4-10(2), 5-11(3), 6-9, 4-5+9-11		12-3, 12-2	5+11, 9-11, 11
Friesian x	4-11, 10-11			
Friesian x Hereford	1-12, 4-12, 5-10			4+12
Friesian x Holstein	4-12			4+12
Friesian x Limousin	4-12			4+12
Friesian x Simmental	4-12			4+12
Galloway x	1-12, 3-1, 5-10			5+10, 12-1
Guernsey			12-2	11
Hereford	5-11, 5-10		12-3	5+11
Hereford x	4-12, 4-11, 4-9, 5-11, 9-12		1-8, 11-4, 12-2	11
Highland	1-12(4), 3-11, 4-11, 5-10(2), 5-8, 6-10		11-3, 12-2, 1-2+5-7	11
Holstein	4-10(2), 5-10	5-10		8-10
Jersey	6-10		12-2	11
Limousin	1-12(2), 4-10, 4-9			
Limousin x	4-11, 4-9, 5-11, 5-10(2)		11-4, 12-2	11
Longhorn	4-10, 5-10		11-4	
Murray Grey	4-9		11-4	
Piemontese x			12-2	11
Red Poll	5-10, 6-3, 11-2		4-5	
Saler x	4-12			4+12
Shetland	7-10			
Simmental x	3-9, 4-11		12-2	
South Devon	6-8			
"Store" cattle	1-12			12-4
Sussex	9-12		1-8	
Welsh Black	5-8			
White Park	1-12		11-4	

Periods of grazing and transfer or removal due to severe weather is probably more characteristic of sites than breed-dependent, but species may be more influential (e.g. removal of cattle in wetter periods to prevent poaching). However, more detailed analysis of grazing regimes in relation to stock type (species and breeds) is beyond the scope of this report.

Table 46. Grazing periods, availability of lay-back land, transfer of stock to lay-back land and removal of stock in severe weather for various pony breeds; numbers refer to months (e.g. 1-3 = January to March; 9-6 = September to June; 1-12 = all year etc.). Numbers in brackets indicate frequency with which that period was recorded if greater than one.

Breed	Grazing Periods	Lay-back Available	Stock Transferred	Stock Removed
Dartmoor	1-3, 9-6, 9-5		7-8	
Exmoor	1-12(5), 5-8, 7-2, 6-7+11-2			
Fell	1-12			
Highland	1-12			
Konik	1-12			
New Forest	1-12(3), 4-9, 5-12			12
Shetland	7-11, 10-12, 3-5+9	7-11		
Welsh Section A	1-12(2), 11-12, 11-3			

3.5.3 Supplementary Feeding

Supplementary feeding of livestock in conservation areas can be contentious: in many sites supplementary feeding may be undesirable because of the risk posed by nutrient enrichment, localised poaching or over-grazing around feeding areas and, when hay is fed, the possible introduction of alien seeds. However stock welfare must be paramount and if supplementary feeding is needed to maintain stock health then the animals may either be fed on lay-back land or, less satisfactorily, on sacrificial areas.

A wide range of supplementary feeds were offered to the various livestock used for conservation grazing (Box 19). Some of these (e.g. energy and vitamin blocks, Rumevite blocks and molasses) may be used without risk of eutrophication (although the problem of localised damage around the feeding station remains). Salt licks and mineral blocks are probably also 'safe'. The other feeds listed in Box 19 are likely to be a source of nutrients not only to the stock but ultimately the pasture. The feeds provided varied between forage and root crops, through formulated compound feeds and concentrates to by-products such as brewers grains and draff (probably equivalent but recorded separately here) or sugar beet pellets and wastes such as 'ort-bucket'.

Box 19: Supplementary feeds offered to grazing livestock

- | | |
|---|---------------------------------------|
| 1. Carrots / Potatoes / Greens | 12. Linseed |
| 2. Green kale | 13. Brewers grains |
| 3. Hay / Silage | 14. Draff |
| 4. Straw / Barley | 15. Seaweed meal |
| 5. Compound feed | 16. Energy / Mineral / Vitamin blocks |
| 6. Concentrates | 17. Rumevite blocks |
| 7. Store pellets | 18. Molasses |
| 8. Sugar beet pellets / Barley sugar lick | 19. Salt licks |
| 9. Goat mix | 20. Ort bucket |
| 10. Maize protein pellets | 21. Supplement not known |
| 11. Oats / Nuts | |

Table 47 shows the range of supplementary feedstuffs fed to sheep of different breeds and whether this differed between age groups or sexes. As the list of feedstuffs may be derived from several sites care must be taken in interpreting the table: not all feeds listed are necessarily fed to the same animals! Neither is quantity apparent - in some instances a handful of concentrates may be more to attract the sheep into a handling pen than for its nutritional value. Finally, it should be noted that a detailed analysis of the period of supplementary feeding is not presented, although a summary for all breeds and species is given in Figure 11. From this it is apparent that supplementary feeding of stock occurs on 86 of the sites in the survey, but this may be for as little as one month each year. The most frequent period of feeding was December to February, practiced on 17 (20%) of the 86 sites. The nine sites on which year-round supplementation is given may have more demanding stock e.g. dairy cattle, or using the feed as suggested above to maintain an ability to easily round up the stock.

If the information was not obtained for sheep on conservation sites it would be unsurprising with the higher protein feeds given to young animals (<2 years old) and to ewes rather than rams (Table 47). Rather more surprising is that of 46 sheep breeds/crosses identified in the survey 33 were fed supplements on at least some sites. These breeds included many of the common 'commercial' breeds but also rare and/or primitive sheep. Some of the hill breeds were only given energy, mineral or vitamin supplements (e.g. Rough Fell, Swaledale, Welsh Mountain).

Of the 13 breeds/crosses (Berrichon du Cher x, Beulah Speckled Face x, Clun Forest, Derbyshire Gritstone, Hampshire Down, Hebridean x Berrichon du Cher, Herdwick x Soay, Kent, Leicester Longwool x, Northumberland Blackface, Portland, Scottish Blackface x, Scottish Halfbred x Suffolk) which do not feature in Table 47 it is probable that for most their absence is due to a nil response rather than a true lack of supplementary feeding, but it is not possible to confirm this assumption.

Table 48 shows a similar analysis for the cattle breeds and crosses; not surprisingly a higher proportion (45 of the 54 breeds and crosses) were recorded as receiving supplementary feeding. However, 14 received only energy, mineral and/or vitamin blocks; these were mainly commercial crosses but also included Guernsey, Jersey and Welsh Black. Four others received

a salt lick alone (Charolais x Simmental) or with Rumevite blocks. Once again, care must be taken in interpreting the lists for other breeds which may be compiled from several sites and do not indicate quantity or period of supplementary feeding.

There is perhaps less difference between the sexes than might at first be expected given the greater demands of pregnancy and lactation on cows. However, this may reflect the widespread use of beef breeds and crosses where the males need to gain weight at a sufficient rate to be marketable within 30 months under the current regime occasioned by BSE. This may also contribute to the greater use of supplementation of the diet of younger cattle apparent from Table 48.

Of the breeds and crosses not included in Table 48 (Aubrac x Galloway, Beef Shorthorn, "Black" Hereford, British White x, Continental x, Devon x, Dexter, South Devon and 'store' cattle) all may be considered hardy breeds but not more so than most of the breeds for which information on supplementary feeding is available. The small size of the Dexter may contribute to an ability to survive without supplementation but individuals might still be expected to need salt licks or mineral blocks where other cattle require them. Once again, it is probably safer to assume a nil response rather than accept that these breeds/crosses are less demanding in their nutrition than others without further confirmation.

Six breeds of pony received supplementary feeding (Table 49); in most instances this was hay. There were no clear trends with age or between the sexes with the greatest variations being between breeds. The Shetland pony only had a salt lick and Highland and Konik ponies did not receive supplementary feeds.

There was no information on supplementary feeding of goats of different ages. Both male and female Bagot goats were fed hay/silage and goat mix. Only female Golden Guernsey and Saanen x were given supplementary feed, the former goat mix and oats/nuts and the latter maize protein pellets and energy/mineral/vitamin blocks. The only record of supplementary feeding of pigs was to female Berkshires up to six years old which were given oats/nuts.

Figure 11. Periods of supplementary feeding of grazing livestock (shaded) with the number of sites using that feeding pattern

Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Number of Sites
Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	9
Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded					1
Shaded	Shaded	Shaded	Shaded	Shaded								1
Shaded	Shaded	Shaded	Shaded									2
Shaded	Shaded	Shaded										1
Shaded	Shaded											2
	Shaded											1
	Shaded	Shaded	Shaded	Shaded				Shaded				1
		Shaded	Shaded	Shaded								4
			Shaded	Shaded	Shaded	Shaded	Shaded					1
			Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	1
				Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded		1
					Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	1
								Shaded	Shaded	Shaded		1
									Shaded	Shaded		4
Shaded	Shaded							Shaded	Shaded	Shaded	Shaded	1
Shaded	Shaded	Shaded	Shaded					Shaded	Shaded	Shaded	Shaded	1
									Shaded	Shaded	Shaded	1
Shaded	Shaded	Shaded							Shaded	Shaded	Shaded	1
Shaded	Shaded	Shaded	Shaded							Shaded	Shaded	1
										Shaded	Shaded	2
Shaded	Shaded	Shaded								Shaded	Shaded	4
Shaded	Shaded									Shaded	Shaded	5
Shaded										Shaded	Shaded	1
Shaded	Shaded	Shaded	Shaded	Shaded							Shaded	1
Shaded	Shaded	Shaded	Shaded								Shaded	5
Shaded	Shaded	Shaded									Shaded	5
Shaded	Shaded										Shaded	17
											Shaded	2
AS REQUIRED												6

Table 47. Supplementary feeds fed to sheep used for grazing; values in brackets indicate the number of records for that feedstuff if greater than one. Supplementary feeding by age and sex is also shown

Key: Carr/Pot/Green: Carrots / Potatoes / Greens
 E/N/V: Energy / Mineral / Vitamin blocks
 SB/Barley S L: Sugar beet pellets / Barley sugar lick

Breed or Cross	Supplementary feedstuffs	Supplements fed to various ages (years)					Supplements fed to sexes	
		< 2	2-5	6-10	> 10	Various	Rames/Wethers	Ewes
Beulah Speckled Face	Hay/Silage (5), Concentrates, Oats/Nuts, E/M/V (2), Rumevite (3), Molasses	Oats/Nuts	Hay/Silage, E/M/V, Rumevite, Molasses	Rumevite (2)	Hay/Silage, Concentrates, E/M/V	Hay/Silage (2)	Hay/Silage (3), Concentrates, E/M/V, Rumevite (2)	Hay/Silage (4), Concentrates, Oats/Nuts, E/M/V, (2), Rumevite (3), Molasses
Beulah Speckled Face x Suffolk	Rumevite		Rumevite				Rumevite	Rumevite
Beulah Speckled Face x Welsh Mule	Hay/Silage, Oats/Nuts		Hay/Silage, Oats/Nuts					Hay/Silage, Oats/Nuts
Black Welsh Mountain	Oats/Nuts							
Bleu du Maine x Cheviot	Store pellets, SB/Barley S L, Maize protein, E/M/V	Store pellets				SB/Barley S L, Maize protein, E/M/V	E/M/V	Store pellets, SB/Barley S L, Maize protein, E/M/V
Bleu du Maine x Lleyn	Store pellets, SB/Barley S L, Maize protein, E/M/V	Store pellets				SB/Barley S L, Maize protein, E/M/V	E/M/V	Store pellets, SB/Barley S L, Maize protein, E/M/V
Bleu du Maine x Mule	Store pellets, SB/Barley S L, Maize protein, E/M/V	Store pellets				Store pellets, SB/Barley S L, Maize protein, E/M/V	E/M/V	Store pellets, SB/Barley S L, Maize protein, E/M/V
Cheviot	Hay/Silage, Compound feed							Hay/Silage, Compound feed
Dorset	Hay/Silage, Rumevite			Hay/Silage, Rumevite				Hay/Silage, Rumevite

Breed or Cross	Supplementary feedstuffs	Supplements fed to various ages (years)					Supplements fed to sexes	
		< 2	2-5	6-10	> 10	Various	Rames/Wethers	Ewes
Exmoor Horn	E/M/V			E/M/V				E/M/V
Hebridean	Hay/Silage, SB/Barley SL (3) Maize protein, Oats/Nuts, E/M/V (2), Rumevite, Molasses, Salt licks (2)		SB/Barley SL(2) Oats/Nuts, E/M/V, Molasses	Rumevite	E/M/V		SB/Barley SL (2), Oats/Nuts, Rumevite	Hay/Silage, SB/Barley S L (3), Maize protein, Oats/Nuts, E/M/V (2), Rumevite, Molasses, Salt licks
Herdwick	E/M/V, Molasses						E/M/V, Molasses	E/M/V, Molasses
Jacob	Hay/Silage Maize protein, Oats/Nuts, E/M/V	Maize protein	E/M/V		Hay/Silage, Oats/Nuts		Hay/Silage, Oats/Nuts, E/M/V	Maize protein, E/M/V
Lleyn	Store pellets, SB/Barley S L, Maize protein, E/M/V	Store pellets				SB/Barley S L, Maize protein, E/M/V	Store pellets	Store pellets, SB/Barley S L, Maize protein, E/M/V
Manx Loghtan	Oats/Nuts			Oats/Nuts				Oats/Nuts
Masham	Hay/Silage Rumevite			Hay/Silage Rumevite				Hay/Silage Rumevite
Mule	Rumevite	Rumevite						Rumevite
Rough Fell	E/M/V					E/M/V		E/M/V
Scottish Blackface	Hay/Silage (2), Compound feed, SB/Barley S L, Brewers grains, E/M/V	Hay/Silage (2), SB/Barley S L, Brewers grains	E/M/V					Hay/Silage (2), Compound feed, SB/Barley S L, Brewers grains, E/M/V
Scottish Halfbred	Oats/Nuts E/M/V					Oats/Nuts E/M/V	E/M/V	Oats/Nuts E/M/V
Shetland	Green kale, Straw/Barley, Oats/Nuts	Green kale, Straw/Barley, Oats/Nuts						Green kale, Straw/Barley, Oats/Nuts

Breed or Cross	Supplementary feedstuffs	Supplements fed to various ages (years)					Supplements fed to sexes	
		< 2	2-5	6-10	> 10	Various	Rames/Wethers	Ewes
Soay	SB/Barley S L, Maize protein (2), Oats/Nuts E/M/V		Maize protein, Oats/Nuts				SB/Barley S L, Maize protein (2), E/M/V	SB/Barley S L, Maize protein (2), Oats/Nuts E/M/V
Southdown	Carr/Pot/Green, Maize protein (2), Oats/Nuts(2), Linseed, E/M/V (2)	Maize protein, Oats/Nuts		Carr/Pot/Green Maize protein. Oats/Nuts, Linseed, E/M/V			Carr/Pot/Green, Maize protein, Oats/Nuts, Linseed, E/M/V (2)	Carr/Pot/Green, Maize protein (2), Oats/Nuts(2), Linseed, E/M/V (2)
Southdown x Jacob	Maize protein, E/M/V		Maize protein, E/M/V					Maize protein, E/M/V
Suffolk	Green kale, Straw/Barley, Oats/Nuts	Green kale, Straw/Barley, Oats/Nuts						Green kale, Straw/Barley, Oats/Nuts
Suffolk x	Hay/Silage (2)							
Swaledale	E/M/V (2)	E/M/V				E/M/V		E/M/V
Teeswater	Green kale, Straw/Barley, Oats/Nuts	Green kale, Straw/Barley, Oats/Nuts						Green kale, Straw/Barley, Oats/Nuts
Texel	Hay/Silage E/M/V, Molasses	E/M/V, Molasses					E/M/V, Molasses	
Texel x	Hay/Silage (2), Oats/Nuts	Oats/Nuts						Oats/Nuts
Welsh Mountain	Oats/Nuts. E/M/V (2)		E/M/V					E/M/V (2)
Welsh Mountain x	Rumevite		Rumevite					Rumevite
Wiltshire Horn	Hay/Silage, Oats/Nuts, Rumevite (2)	Hay/Silage, Oats/Nuts, Rumevite	Rumevite					Hay/Silage, Oats/Nuts, Rumevite

Table 48. Supplementary feeds fed to cattle used for grazing; values in brackets indicate the number of records for that feedstuff if greater than one. Supplementary feeding by age and sex is also shown

Key: Carr/Pot/Green: Carrots / Potatoes / Greens
 E/N/V: Energy / Mineral / Vitamin blocks
 SB/Barley S L: Sugar beet pellets / Barley sugar lick

Breed or Cross	Supplementary feedstuffs	Supplements fed to various ages (years)					Supplements fed to sexes	
		< 2	2-5	6-10	> 10	Various	Bulls/steers	Cows
Aberdeen Angus	Hay/Silage, SB/Barley S L, Oats/Nuts (2), E/M/V	Hay/Silage, SB/Barley S L Oats/Nuts (2), E/M/V					SB/Barley S L, Oats/Nuts	Hay/Silage, SB/Barley S L, Oats/Nuts, E/M/V
Aberdeen Angus x Friesian	E/M/V		E/M/V					E/M/V
Beef Shorthorn x	Carr/Pot/Green, Hay/Silage, E/M/V (3), Molasses	E/M/V	Hay/Silage, E/M/V, Molasses			Carr/Pot/Green E/M/V	Hay/Silage, E/M/V (2), Molasses	Hay/Silage, E/M/V (2), Molasses
Beef Shorthorn x Hereford	E/M/V		E/M/V					E/M/V
Beef Shorthorn x Jersey x Longhorn	E/M/V	E/M/V						E/M/V
Beef Shorthorn x British White x Friesian x Hereford	E/M/V		E/M/V				E/M/V	E/M/V
Beef Shorthorn x British White x Friesian	E/M/V	E/M/V					E/M/V	
Belgian Blue	Rumevite Salt lick							
Belgian Blue x	E/M/V (2)	E/M/V	E/M/V					E/M/V (2)
Blonde d'Aquitaine	Rumevite Salt lick							

Breed or Cross	Supplementary feedstuffs	Supplements fed to various ages (years)					Supplements fed to sexes	
		< 2	2-5	6-10	> 10	Various	Bulls/steers	Cows
Blonde d'Aquitaine x	E/M/V (2)	E/M/V	E/M/V					E/M/V (2)
British White	Hay/Silage (3), SB/Barley SL, Seaweed meal, E/M/V (2), Molasses		Hay/Silage (2), E/M/V (2), Molasses				Hay/Silage (2), E/M/V, Molasses	Hay/Silage (2), E/M/V, Molasses
British White x Friesian	E/M/V		E/M/V					E/M/V
British White x Friesian x Hereford	E/M/V			E/M/V				E/M/V
Charolais	Rumevite Salt lick							
Charolais x	Concentrates, E/M/V	Concentrates, E/M/V					Concentrates	Concentrates, E/M/V
Charolais x Friesian	E/M/V			E/M/V				E/M/V
Charolais x Simmental	Salt lick	Salt lick					Salt lick	
Devon	Hay/Silage (2), SB/Barley SL Seaweed meal, E/M/V (2)							
Friesian	Hay/Silage, E/M/V, Rumevite, Salt lick, Not known	E/M/V	Not known				Hay/Silage, Rumevite, Salt lick	E/M/V, Not known
Friesian x	Carr/Pot/Green Concentrates, E/M/V	Carr/Pot/Green Concentrates, E/M/V					Carr/Pot/Green Concentrates, E/M/V	Carr/Pot/Green Concentrates, E/M/V
Friesian x Hereford	Hay/Silage, E/M/V Rumevite		E/M/V			Hay/Silage, Rumevite		Hay/Silage, E/M/V Rumevite
Friesian x Holstein	E/M/V		E/M/V					E/M/V

Breed or Cross	Supplementary feedstuffs	Supplements fed to various ages (years)					Supplements fed to sexes	
		< 2	2-5	6-10	> 10	Various	Bulls/steers	Cows
Friesian x Limousin	E/M/V		E/M/V				E/M/V	E/M/V
Friesian x Simmental	E/M/V		E/M/V				E/M/V	E/M/V
Galloway x	Hay/Silage, Straw/Barley, Rumevite		Hay/Silage, Straw/Barley, Rumevite				Hay/Silage, Straw/Barley, Rumevite	
Guernsey	E/M/V	E/M/V						E/M/V
Hereford	Hay/Silage							
Hereford x	Hay/Silage, Oats/Nuts E/M/V Rumevite, Salt lick	E/M/V				Hay/Silage, Oats/Nuts	Hay/Silage, Oats/Nuts	Hay/Silage, Oats/Nuts E/M/V
Highland	Hay/Silage (3), Straw/Barley, Compound feed, Concentrates, SB/Barley S L, Brewers grains, Draff, E/M/V (2)	Hay/Silage, SB/Barley S L, Brewers grains, E/M/V (2)	Hay/Silage, Straw/Barley, Concentrates, SB/Barley SL, Brewers grains			Hay/Silage, Straw/Barley, Brewers grains, Draff	Hay/Silage, Straw/Barley, SB/Barley S L, Brewers grains	Hay/Silage (3), Straw/Barley, Compound feed, Concentrates, SB/Barley S L, Brewers grains, Draff, E/M/V (2)
Holstein	Concentrates, Molasses	Concentrates, Molasses					Concentrates	Concentrates, Molasses
Jersey	E/M/V (2)	E/M/V				E/M/V	E/M/V	E/M/V (2)
Limousin	Oats/Nuts					Oats/Nuts	Oats/Nuts	Oats/Nuts
Limousin x	Hay/Silage, Compound feed, Concentrates, Oats/Nuts, E/M/V, Rumevite, Salt lick	Concentrates, E/M/V					Hay/Silage, Compound feed, Concentrates, Oats/Nuts	Hay/Silage, Compound feed, Concentrates, Oats/Nuts, E/M/V

Breed or Cross	Supplementary feedstuffs	Supplements fed to various ages (years)					Supplements fed to sexes	
		< 2	2-5	6-10	> 10	Various	Bulls/steers	Cows
Longhorn	Hay/Silage (2), Rumevite					Hay/Silage, Rumevite		Hay/Silage, Rumevite
Murray Grey	Oats/Nuts					Oats/Nuts	Oats/Nuts	Oats/Nuts
Piemontese x	E/M/V	E/M/V						E/M/V
Red Poll	Hay/Silage, SB / Barley S L, Seaweed meal, E/M/V							
Saler	Oats/Nuts, Rumevite, Molasses	Oats/Nuts, Rumevite, Molasses						Oats/Nuts, Rumevite, Molasses
Saler x	E/M/V		E/M/V					E/M/V
Shetland	Hay/Silage, E/M/V							Hay/Silage, E/M/V
Simmental x	Hay/Silage, E/M/V Rumevite	Hay/Silage, E/M/V Rumevite					Hay/Silage, Rumevite	Hay/Silage, E/M/V Rumevite
Sussex	Hay/Silage, Maize protein, E/M/V				Maize protein E/M/V	Hay/Silage	Hay/Silage, Maize protein, E/M/V	Hay/Silage, Maize protein, E/M/V
Welsh Black	E/M/V	E/M/V					E/M/V	
White Park	Oats/Nuts						Oats/Nuts	Oats/Nuts

Table 49. Supplementary feeds fed to ponies used for grazing; values in brackets indicate the number of records for that feedstuff if greater than one. Supplementary feeding by age and sex is also shown

Key: Carr/Pot/Green: Carrots / Potatoes / Greens
E/N/V: Energy / Mineral / Vitamin blocks

Breed	Supplementary feedstuffs	Supplements fed to various ages (years)					Supplements fed to sexes	
		< 2	2-6	6-10	11-20	Various	Stallions/geldings	Mares
Dartmoor	Hay/Silage (2), Salt lick		Hay/Silage			Hay/Silage, Salt lick	Hay/Silage (2), Salt lick	Hay/Silage
Exmoor	Hay/Silage (3), Oats/Nuts, E/M/V		Hay/Silage, Oats/Nuts,			Hay/Silage E/M/V	Hay/Silage (3), Oats/Nuts, E/M/V	
Fell	Carr/Pot/Green Hay/Silage, Oats/Nuts	Carr/Pot/Green Hay/Silage, Oats/Nuts						Carr/Pot/Green Hay/Silage, Oats/Nuts
New Forest	Hay/Silage (2), E/M/V				E/M/V	Hay/Silage, E/M/V	Hay/Silage (2), E/M/V	Hay/Silage
Shetland	Salt lick					Salt lick		
Welsh Section A	Hay/Silage (2), E/M/V		E/M/V	Hay/Silage		Hay/Silage	E/M/V	Hay/Silage (2)

3.6 Stock Health Problems and Veterinary Treatments

A number of questions were directed at determining the health problems of stock used in conservation grazing and the veterinary treatments (both preventative and curative) used by stock managers to combat these problems. Brief descriptions of the diseases and other ailments are given in the footnotes to Tables 50, 52 and 54.

3.6.1 Health Problems of Sheep used for Conservation Grazing

In all 18 health problems were identified in sheep (Box 20); these varied from infections, dietary deficiencies, external and internal parasites through less explicit ailments such as 'foot problems' and 'loss of condition' to broken bones and dog attacks. By far the most commonly reported problem was fly strike which was reported almost three times more frequently than loss of condition, the next most frequent problem. Loss of condition can result from a number of causes including inadequate nutrition, dietary deficiency, internal or external parasites and bacterial or viral infection; it is therefore often a symptom of one of the other problems.

Another fly-caused condition is headfly which was reported six times. Footrot was reported nine times, although the four instances of 'foot problems' may include further cases of footrot. New Forest eye (more often applied to a similar infection in cattle) and pink eye probably refer to the same condition (contagious ophthalmia); together these were reported on six occasions. Pneumonia was recorded five times. The six recorded instances of dog attack are particularly worrying as too often the attack is not witnessed and fatalities occur with little opportunity for treatment.

Box 20: Health problems recorded in sheep flocks; numbers in brackets indicate number of records

1. Footrot (9)	10. Headfly (6)
2. Infection (2)	11. Gid (1)
3. Mastitis (3)	12. Liverfluke (1)
4. New Forest eye (3)	13. Tapeworm (1)
5. Orf (3)	14. Worms (2)
6. Pink eye (3)	15. Foot problems (4)
7. Pneumonia (5)	16. Loss of condition (10)
8. Cobalt deficiency (1)	17. Broken bones (1)
9. Flystrike (28)	18. Dog attacks (6)

As well as identifying health problems respondents were asked what proportion of the stock were affected and how frequently the problem recurred. Table 50 shows the health problems of individual sheep breeds together with an indication of the proportion of the flock affected. Most of the 27 breeds and crosses were susceptible to fly strike, although it was not recorded in Mule, Rough Fell, Scottish Halfbred, Soay, Swaledale or Wiltshire Horn. In breeds in which it occurred it appeared to either affect <10% of the flock or 90-100%. Headfly occurred in both polled (e.g. Beulah Speckled Face, Texel) and horned (e.g. Hebridean, Manx Loghtan) breeds.

Where footrot occurred it generally affected up to 20% of the flock although could be more widespread e.g. 61-70% of a Soay flock and 90-100% of a Southdown flock. Despite its potential for rapid spread, New Forest eye / Pink eye was generally confined to <10% of the flock, but was recorded in 90-100% of one Beulah Speckled Face flock. Loss of condition was recorded in 10 breeds and crosses and was another problem that in some breeds (e.g. Bleu du Maine crosses and Lleyn) affected <10% of the flock but in others (e.g. Dorset, Masham, Mule) affected 90-100%. Perhaps surprisingly, dog attacks appeared to be mainly on hill breeds and crosses (Beulah Speckled Face, Rough Fell, Scottish Halfbreeds and Swaledale) rather than less agile down breeds or smaller primitive breeds; the only exception was an instance of dog attack on Soay.

Beulah Speckled Face and Hebridean had the longest lists of health problems but this probably reflects more their widespread use in conservation grazing projects (and hence representation in the survey) than any inherent susceptibility to disease. Both breeds had a similar list of health problems with the only differences being an unspecified 'infection' in Hebrideans and gid and dog attacks in Beulah Speckled Face. Loss of condition was reported to have affected 41-50% of one Beulah Speckled Face flock; the only record of loss of condition in Hebrideans was unquantified.

With respect to frequency of occurrence (Table 51) fly strike and headfly appeared to be an annual occurrence in some flocks but occasional in others. Rare occurrences included gid in Beulah Speckled Face and footrot in Hebridean and Soay; in contrast footrot occurred several times a year in one Beulah Speckled Face flock and 'often' in a Southdown flock. A Southdown flock also suffered from tapeworms several times per year. Pneumonia was reported as an annual occurrence in one Dorset and one Masham flock but was occasional in Black Welsh Mountain and Jacob. Mastitis was an annual occurrence in the four breeds where it occurred. Dog attacks were generally rare or at worst occasional.

3.6.2 Health Problems of Cattle used for Conservation Grazing

A total of 22 health problems were recorded for cattle (Box 21) and included a similar range of infections, dietary deficiencies, external and internal parasites and less specific ailments to that recorded for sheep. There were some notable differences: in cattle mineral deficiencies were more varied and frequent, birth (calving) problems were quite common, there were instances of poisoning and dog attacks were fewer, although not unknown. Descriptions of the reported cattle diseases are given in the footnotes of Table 52.

Box 21: Health problems reported for cattle used in grazing schemes; numbers in brackets indicate number of records

- | | |
|------------------------------|---------------------------|
| 1. Blackleg (1) | 12. Liverfluke (17) |
| 2. Mastitis (12) | 13. Ticks (5) |
| 3. New Forest eye (18) | 14. Worms (7) |
| 4. Pneumonia (30) | 15. Bloat (12) |
| 5. Redwater Fever (1) | 16. Calving problems (6) |
| 6. Copper deficiency (12) | 17. Foot problems (9) |
| 7. Hypomagnesaemia (2) | 18. Loss of condition (6) |
| 8. Magnesium deficiency (12) | 19. Overweight (1) |
| 9. Selenium deficiency (11) | 20. Dog attacks (1) |
| 10. Flystrike (23) | 21. Trapped (1) |
| 11. Headfly (2) | 22. Poisoning (3) |

Table 50. Health problems recorded for sheep used in grazing; numbers in brackets indicate number of times that health problem was recorded if greater than one (there were no records for 31-40%, 51-60%, 71-80%, 81-90%)

Breed or Cross	Percentage of flock affected							
	< 10	11-20	21-30	41-50	61-70	91-100	Varies	Not recorded
Berrichon du Cher x	Flystrike ¹							
Beulah Speckled Face	Footrot ² , Mastitis ³ , New Forest Eye ⁴ , Flystrike (3), Headfly ⁵ , Gid ⁶ , Dog attacks			Loss of condition		Pink eye ⁴ , Flystrike	Orf ⁷ , Pink eye	Footrot, Flystrike
Beulah Speckled Face x Suffolk	Flystrike							Dog attacks
Black Welsh Mountain	Infection, Pneumonia ⁸ , Flystrike							
Bleu du Maine x Cheviot	Flystrike, Loss of condition							
Bleu du Maine x Lleyn	Flystrike, Loss of condition							
Bleu du Maine x Mule	Flystrike, Loss of condition							
Dorset						Pneumonia, Fly strike, Loss of condition		Foot problems
Exmoor Horn	Footrot, Flystrike							Liverfluke ⁹
Hebridean	Footrot, Infection, Mastitis, New Forest eye, Flystrike, Headfly					Flystrike	Orf	Flystrike, Foot problems, Loss of condition
Herdwick	Mastitis, New Forest eye, Headfly					Flystrike		
Jacob	Flystrike	Pneumonia						
Lleyn	Flystrike, Loss of condition							
Manx Loghtan	Flystrike, Headfly, Broken bones	Headfly				Cobalt deficiency		
Masham						Pneumonia, Flystrike, Loss of condition		Foot problems
Mule		Foot problems				Loss of condition		
Rough Fell							Dog attacks	
Scottish Blackface x	Flystrike	Footrot						

Breed or Cross	Percentage of flock affected							
	< 10	11-20	21-30	41-50	61-70	91-100	Varies	Not recorded
Scottish Halfbred								Dog attacks
Soay					Footrot, Orf			Dog attacks
Southdown	Flystrike (2)	Footrot				Footrot, Tapeworm ¹⁰ , Worms		
Southdown x Jacob	Flystrike							
Swaledale							Dog attacks	
Texel	Mastitis, New Forest eye, Headfly					Flystrike		
Texel x	Flystrike	Footrot						
Welsh Mountain	Flystrike							Loss of condition
Wiltshire Horn			Worms					

¹ Flystrike (blowfly myiasis): infestation of live sheep with maggots of blowflies such as *Lucilia sericata*; if untreated affected sheep die within a few days. *L. sericata* can initiate an infestation on wounds or in wet wool (e.g. below dung soiling) but once started many other flies can contribute to the maggot infestation.

² Footrot: a serious disease in which hoof tissues are infected with two species of bacteria: *Fusobacterium necrophorum* (which alone causes the relatively minor condition called scald) and *Bacterioides nodosus* which can only invade hooves damaged by *F. necrophorum*. Footrot is difficult to eradicate once established as *F. necrophorum* is long-lived in soil (whereas *B. nodosus* survives <10 days). Infected sheep are lame and in the worst cases the necrotic tissues may be invaded by fly maggots.

³ Mastitis is an inflammation of the udder caused by bacterial (usually *Staphylococcus aureus* but often with others) infection. Hyperacute cases lead to gangrene in the udder and are frequently fatal; less acute cases may recover, especially if treated with antibiotics, but may lose the infected 'quarter' of the udder.

⁴ New Forest Eye and Pink Eye: caused by a rickettsial (*Rickettsia conjunctivae*) infection of the conjunctiva. Carrier sheep may be unaffected until the surface of the eye is damaged e.g. by long grass, heather, flies, dust etc. It can be highly infectious and is spread by flies, dust or on vegetation; if untreated the eyes may ulcerate and the sheep will be at least temporarily blind.

⁵ Headfly: adults of the fly *Hydrotaea irritans* attack damaged or thin skin especially at the base of the horns (or scurs in polled sheep). Most common on pasture adjoining woodland where the flies rest. Wounds caused by feeding flies may become infected or subject to fly strike.

⁶ Gid: cystic stage of the dog tapeworm *Taenia multiceps* found in the brain of ruminants. Symptoms depend on the site of the cyst within the brain.

⁷ Orf: a viral infection that causes ulcers, especially around the mouth. Highly contagious, and can be passed to humans. In the 'benign' type recovery is usual especially if treated to prevent secondary infection, but in the rarer 'malignant' type ulcers can occur in many sites and are usually fatal.

⁸ Pneumonia may be caused by bacterial infections e.g. *Pasteurella haemolytica* or *P. trehalosi*, lungworms (e.g. *Dictyocaulus filaria*, *Muellerius capillaris*) or mechanically e.g. by incorrect use of a drenching gun.

⁹ Liverfluke: a parasitic fluke *Fasciola hepatica* which lives in the bile ducts. To reach the ducts larval flukes migrate through, and so damage, the liver. Severity of resulting disease depends on number of parasites but can vary from sudden death to a chronic wasting disease. Life cycle of fluke includes an intermediate host - the mud snail *Lymnaea truncatula* - so wet pastures or adjoining water bodies are required for completion of the life cycle.

¹⁰ Tapeworm: in sheep the principal tapeworm is *Moniezia expansa* which, although reaching 2m in length, is generally harmless except in very high infestations. Adult sheep are usually resistant but lambs may develop large infestations. The white egg-bearing segments of the tapeworm are clearly visible in the dung of infected lambs.

Table 51. Frequency of health problems recorded for sheep used in grazing; numbers in brackets indicate number of times that health problem was recorded if greater than one

Breed or Cross	Frequency of occurrence					
	Rare	Occasional	Annual	Several yr ⁻¹	Often	Not recorded
Berrichon du Cher x		Flystrike				
Beulah Speckled Face	Gid	Flystrike (2)	Mastitis, New Forest eye, Orf, Pink eye (2), Flystrike (2), Headfly, Loss of condition	Footrot		Footrot, Flystrike, Dog attacks
Beulah Speckled Face x Suffolk		Flystrike				Dog attacks
Black Welsh Mountain	Infection	Pneumonia, Flystrike				
Bleu du Maine x Cheviot			Fly strike, Loss of condition			
Bleu du Maine x Lleyn			Fly strike, Loss of condition			
Bleu du Maine x Mule			Fly strike, Loss of condition			
Dorset			Pneumonia, Fly strike, Loss of condition			Foot problems
Exmoor Horn			Flystrike			Footrot, Liverfluke
Hebridean	Footrot, Infection	Orf, Flystrike (4)	Mastitis, New Forest eye, Flystrike, Headfly			Foot problems, Loss of condition
Herdwick			Mastitis, New Forest eye, Flystrike, Headfly			
Jacob		Pneumonia, Flystrike				
Lleyn			Flystrike, Loss of condition			
Manx Loghtan		Flystrike, Headfly, Broken bones	Cobalt deficiency			
Masham			Pneumonia, Flystrike, Loss of condition			Foot problems
Mule		Foot problems				Loss of condition
Rough Fell	Dog attacks					

Breed or Cross	Frequency of occurrence					
	Rare	Occasional	Annual	Several yr ⁻¹	Often	Not recorded
Scottish Blackface x			Footrot, Flystrike			
Scottish Halfbred		Dog attacks				
Soay	Footrot, Orf, Dog attacks					
Southdown		Flystrike, Worms	Footrot, Flystrike	Tapeworm	Footrot	Flystrike
Southdown x Jacob		Flystrike				
Swaledale	Dog attacks					
Texel			Mastitis, New Forest eye, Flystrike, Headfly			
Texel x			Footrot, Flystrike			
Welsh Mountain		Flystrike				Loss of condition
Wiltshire Horn		Worms				

By far the most common infection was pneumonia which constituted almost 16% of all recorded problems (Box 21). New Forest eye and mastitis were other common infections whereas blackleg and redwater fever were each only recorded once. Dietary deficiencies included copper, magnesium and selenium; hypomagnesaemia and magnesium deficiency are recorded separately, although the former may have been used as a more scientific term for the latter; alternatively it may refer to the acute effects of magnesium deficiency as opposed to a chronic condition. The three deficiencies occurred with similar frequencies.

Amongst the parasitic infections flystrike was again a major problem with 23 herds affected; ticks were quite common but headfly was much less of a problem than for sheep. Liverfluke was a considerable problem, perhaps reflecting the greater use of cattle in wet habitats where the intermediate snail host occurs. Lush vegetation in such habitats may also contribute to the relatively frequent occurrence of bloat. On the other hand loss of condition was also recorded quite commonly. Foot problems, probably referring mainly to the need to trim hooves at intervals, were another common 'ailment'.

Table 52 shows the breakdown of health problems by breed and proportion of the herd affected. Pneumonia affected 23 of the 36 breeds and crosses, but generally <10% of the herd were infected; the one exception was a Galloway x herd in which 71-80% of the herd were infected. New Forest eye and mastitis showed similar patterns with 17 and 12 breeds affected respectively, but generally in <10% of each herd; some herds recorded varying levels for both diseases. Mastitis may be expected to be less common as clearly it would not be found in males, castrates or non-lactating females.

The dietary deficiencies (copper, selenium, magnesium) tended to occur in the same breeds and may therefore be breed characteristic or, more likely, nutrient-deficient herbage on which the cattle were kept. However, it is noticeable that magnesium and selenium deficiencies occurred in <10% of the individuals within herds which suggests that there are varying susceptibilities to these deficiencies which may reflect genetic differences within breeds. Copper deficiency, in contrast, affected 91-100% of individuals when it was recorded.

The incidence of flystrike was similar to that in sheep in that for most of the 16 affected breeds or crosses either <10% or 91-100% of cattle within herds were attacked. Liverfluke occurred in 15 breeds and crosses but always affected <10% of the herd; again this may reflect differences in genetic susceptibility to fluke infection, or that some individuals show symptoms earlier, or more clearly, than others leading to treatment of the entire herd. Given the general impression of conservation grazing being less productive than ryegrass leys, the incidence of bloat in 11 breeds and crosses is surprising; as suggested above, perhaps these animals were grazing lush wetland habitats. Variation in susceptibility between individuals is again suggested with <10% of the herd affected; this may be the result of behavioural differences in grazing as much as genetic variation.

Loss of condition was perhaps less frequent than might be expected given the reluctance of farmers to graze less productive conservation sites. More surprisingly it was recorded in <10% of Friesians but 91-100% of traditional or rare breeds such as British White, Devon and Red Poll. It also occurred in 91-100% of an unspecified Friesian x, but in <10% of a Friesian x Hereford herd. Calving and foot problems were recorded in many of the continental breeds and crosses (Belgian Blue, Blonde d'Aquitaine, Charolais, Limousin x) but also in Friesian and

Hereford x. Foot problems were also recorded in Hereford and Highland with the 91-100% of a herd of the latter suffering compared to <10% of the other breeds and crosses.

Table 53 shows the frequency of occurrence of cattle health problems. Pneumonia, mastitis and New Forest eye were annual occurrences in 11 herds (not necessarily the same ones) but occasional in most other herds. Copper and magnesium deficiencies tended to be annual but selenium deficiency was occasional. Flystrike occurred annually in 15 herds but occasionally in six herds and liverfluke occurred occasionally in 12 herds but several times per year in the remaining five herds for which it was recorded. In the five herds in which ticks were recorded they were an annual problem. Bloat was always recorded as an occasional occurrence whereas loss of condition was rare, occasional or weather-dependent. It is worrying that for the one herd for which dog attacks were recorded they occurred annually.

3.6.3 Health Problems of Goats used for Conservation Grazing

Health problems were recorded for just two of the breeds of goats. In Cashmere goats headfly annually affected 91-100% of the flock whereas in Saanen x footrot occurred annually in 91-100% of the flock. Hoof growth was also recorded as a problem in Saanen x but, as might be expected, the proportion of the flock affected and its frequency of occurrence was not recorded.

3.6.4 Health Problems of Ponies used for Conservation Grazing

Table 54 shows the 11 health problems recorded for ponies, including the rather enigmatic 'death'. Some ailments are associated with an overly lush diet e.g. the laminitis (and possibly the colic) occasionally recorded in some Shetlands. On the other hand, loss of condition was recorded occasionally for a small proportion of Dartmoors and annually for 91-100% of New Forest ponies for which an annual loss of condition appears natural; however it often leads to public criticism as the ponies look underfed. The occasional occurrence of footrot in 71-80% of Exmoors and the annual flystrike recorded for Konik ponies are potentially serious problems in breeds with otherwise good track records in conservation grazing.

3.6.5 Frequency of Checks on Health of Stock

Respondents were asked 'how regularly are your animals checked?'; in retrospect it would have been better to distinguish between routine and relatively superficial checks of the flock/herd as a whole and more detailed checks on the health of individual animals. However, the responses obtained are shown in Table 55; note that these categories were not suggested in the questionnaire but are based on the responses obtained. "Regularly" and "Infrequently" are thus undefined and their position in the table should not be taken as indicative of their relation to the other time periods listed. There was no response to the question from 15 sites (12%).

Guidance on stock welfare (e.g. Grayson in Crofts and Jefferson, 1999) suggests that stock should be checked at least daily; approximately two-thirds of the stock in the survey were checked once or twice daily and a further 13% were checked several times per week. Worryingly, stock on 5% of sites appeared to be checked no more often than weekly but this may indicate that the respondents were citing the frequency of more formal checks on individual animals. Alternatively, it may be that the respondents were giving the frequency