

*banish Rams, during nine years, supposing one fifth of the Ewes to be reformed each year,
 h of the Lambs for losses and accidents.*

4th DEGREE.		AMOUNTS		of Ewes of the 4th degree.		NUMBER		of remaining Ewes of the 3d degree.		LAMBS.		SALE of male Lambs of the preceding year.		of the year.		of the year and those preceding.		of the reforms made at the beginning of each year.		of the sales of Lambs made in the course of the year.		of the Flock at the end of each year.		EXPLANATION OF THIS TABLE.	
males.	females.	males.	females.	males.	females.	males.	females.	males.	females.	males.	females.	males.	females.	males.	females.	males.	females.	males.	females.	males.	females.	males.	females.		
32.	102.	207.	84.	40.	168.	220.	92.	24.	24.	24.	24.	12.	40.	84.	40.	168.	220.	92.	24.	24.	24.	12.	40.	84.	900.
.	100.	200.	200.	200.	910.	1. The reforms, the sale of the lambs, and the amount of the flock at the end of each year, are easy to be found; because all that is necessary is to cast one's eye on the respective columns.
.	90.	155.	155.	155.	1,073.	2. As to the amount of the flock at the end of each year, it is composed in the following manner: of the lambs of the present year; of the thaives; of the ewes of three years old and upwards. Exam- ple, taken at the end of the ninth year: 5,077 animals; viz. 10 lambs of the 5th degree, 368 lambs of the 4th; moreover, 40 thaives of the same; 12 ewes three years old of the same degree. For the 3d. 392 lambs; moreover, 16 thaives; 1.5 ewes three years old; 76 four years old; 32 five years old; deducting 20 reformed. For the 2d. degree, 538 lambs; moreover 154 thaives; 160 ewes three years old; 150, four years old; 150, five years old; 126, six years old; deducting 82 reformed. The whole stock of the first degree being exact, it cannot here be taken into account.	
.	102.	204.	204.	204.	1,219.		
.	121.	226.	226.	226.	1,446.		
.	131.	262.	262.	262.	1,616.		
.	278.	236.	236.	236.	1,218.		
.	118.	297.	297.	297.	1,631.		
.	175.	358.	358.	358.	2,077.		
.	3,145.	1,938.	1,938.	1,938.			

of the flock is to be at least four hundred, comprehending, animals of every age ; each year, immediately after shearing, the fleeces and a part of the animals, not exceeding a fifth of the bearing ewes and three fourths of the rams, are to be sold and the proceeds equally shared ; the oldest animals are to be among those which are sold. When the flock is arrived at an increase of four hundred, the owner is to have the right to select one hundred ewes from three to five years old, and six rams of the same age, to be disposed of as he pleases ; the remainder of the flock and its subsequent increase are to be kept at the common expense of the owner and farmer*, and all the profits equally divided. The farmer is not to have upon his farm any other flock beside the one which he has on shares. At the expiration of the twelve years, the owner is to take one hundred ewes and six rams, and to have the half of what remains. If the contract is, for any reason, cancelled before its term, one hundred ewes and six rams are at all events to be taken out by the owner or his heirs before the division of the stock.

Other forms may undoubtedly be given to this kind of contract: as there is a variety in the respective situations of the owners and farmers, in the manner of treating and feeding the flocks, and in the usages of different places, there must necessarily be modifications which I cannot foresee, and which should be admitted, provided the mutual interests of the contracting parties be attended to. The more nearly the above conditions are followed, the less will be the deviation from the line of justice. As a still farther direction, I will shew, in the first place, in a table, the propagation of a flock of five hundred ewes of the common race, crossed by Spanish rams, a fifth of the bearing ewes being reformed each year, and a deduction of one fifth of the lambs being made for losses and accidents ; then I will detail, in three schemes, the whole expense and profit of the proprietor and of the farmer during a contract for nine years, which is the most usual time. I shall rather suppose the flock to be of a mixed than of a full blooded race, because the value of its products is more easily estimated, although every year a part becomes more valuable ; the valuation of the products of a flock of merinos is more fluctuating, on account of the irregularity in the sale of the rams. As the price of grain and fodder, which is different in different

* It may be feared that the farmer will abuse the trust reposed in him, and make the owner pay too dear for what he furnishes for the support of the shepherds and of the flock, and for the wages of the shepherds, but it is easy to know nearly the prices, if a little attention be paid : besides, such bargains as these ought to be made with none but honest men.

places, affects the expenses of the farmer, I shall choose the distance of fifty leagues to the south of Paris, at which it is to be supposed that the following calculations are made.

*First Scheme of a Cheptel**

In this scheme, the farmer furnishes five hundred ewes, the interest of which is paid to him at five per cent during the nine years of the contract ; he gives 50 centimes for each lamb, the 2d. 3d. 4th. and 5th years ; and one frank the remaining four years. The proprietor is obliged to furnish fifteen merino rams for covering. The farmer has the proceeds of the sales of the reformed ewes, of the castrated male lambs and of the wool, and he has the manure ; at the expiration of the contract, what he paid for the five hundred ewes is reimbursed to him and the whole flock remains the property of him to whom the farm belongs.

RECEIPTS OF THE FARMER.

Sale of Wool and of Animals.

FIRST YEAR.

500 fleeces of common ewes, at 2 francks per fleece	1,000f 00c
400 lb. of lamb's wool, first cross, at 40c. a pound	16f 00
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	1,160 00
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SECOND YEAR.

Sale of 100 common ewes at 10 fr. each . . .	1,000f 00c
do. of 200 wethers of a single cross, at 6 fr. each	1,200 00
do. of 400 fleeces of common ewes, at 2 fr. each	800 00
do. of 200 fleeces of lambs in their second year, of a single cross, 3 fr. 50c. per fleece . . .	700 00
do. of 300 lb. of lamb's wool, of the first cross, at 40c. per pound	120 00
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	3,820 00
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THIRD YEAR.

Sale of 90 common ewes, at 8 fr. each	720 00
do. of 150 wethers of a single cross, at 6 fr. each . . .	930 00
310 fleeces of common ewes, at 2 fr. each	620 00
155 fleeces of lambs in their second year, of a single cross, at 3 fr. 50c. each	542 50
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	2,812 50
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* Cheptel signifies a contract by which sheep are put out on shares.

	<i>Brought forward</i>	2,812 50c
200 fleeces of ewes three year old, of a single cross, at 3 fr. 50c each		700 00
248 lbs. of lamb's wool, of a single cross, at 40c. per lb		99 20
160 lbs. of lamb's wool, of a double cross, at 80c. per lb		128 00
		<u>3,739 70</u>

FOURTH YEAR.

Sale of 62 common ewes, at 8 fr. each	496 00
do. of 124 wethers of a single cross, at 6 fr. each	744 00
do. of 80 wethers of a double cross, at 12 fr. each	960 00
248 fleeces of common ewes, at 2 fr. per fleece	496 00
439 fleeces of ewes of a single cross, at 3 fr. 50c. per fleece	1,536 50
80 fleeces of lambs in their second year, of a double cross, at 6 fr. 50c. per fleece	520 00
200 lbs. of lamb's wool, of a single cross, at 40c. per pound	80 00
252 lbs. of lamb's wool, of a double cross, at 80c. per lb	201 60
Moreover, the sale of 40 ewes of a single cross, at 12 fr. each	480 00
	<u>5,514 10</u>

FIFTH YEAR.

Sale of 48 common ewes, a 6 fr. each	288 00
do. of 100 wethers of a single cross, at 6 fr. each	600 00
do. of 126 wethers of a double cross, at 12 fr. each	1,512 00
200 fleeces of common ewes, at 2 fr. each	400 00
516 fleeces of ewes of a single cross, at 3fr. 50c. each	1,806 00
206 fleeces of ewes of a double cross, at 6 fr. 50 c. each	1,399 00
160 lb. of lamb's wool, of a single cross, at 40c. per lb.	64 00
300 lbs. of lambs wool, of a double cross, at 80c. per lb.	240 00
80 lbs. of lamb's wool, of a third cross, at 1 fr. 20c. per lb.	96 00
Sale of 63 ewes of a single cross, at 12 fr. each	756 00
	<u>7,101 00</u>

SIXTH YEAR.

Sale of 48 common ewes, at 6 fr. each	288f 00c
do. of 80 wethers of a single cross, at 6 fr. each	480 00
do. of 75 ewes of a single cross, at 16 fr. each	1,200 00
do. of 16 ewes of a double cross, at 20 fr. each	320 00
do. of 150 wethers of a double cross, at 12 fr. each	1,800 00
do. of 32 wethers of a treble cross, at 18 fr. each	576 00
160 fleeces of common ewes, at 2 fr. each	320 00
539 fleeces of ewes of a single cross, at 3 fr. 50c. each	1,886 50
340 fleeces of ewes of a double cross, at 6 fr. 50c. each	2,210 00
32 fleeces of ewes of a treble cross, at 10 fr. each	320 00
128 lbs. of lamb's wool, of a single cross, at 40c. per lb.	51 20
320 lbs. of lamb's wool, of a double cross, at 80c. per lb.	256 00
195 lbs. of lamb's wool, of a third cross, at 1 fr. 20c. per lb.	234 00
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	9,941 70
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SEVENTH YEAR.

Sale of 160 common ewes, at 4 fr. each	640 00
do. of 80 ewes of a single cross, at 16 fr. each	1,280 00
do. of 38 ewes of a double cross, at 20 fr. each	760 00
do. of 160 wethers of a double cross, at 12 fr. each	1,920 00
Sale of 76 wethers of a third cross, at 18 fr. each	1,368 00
400 fleeces of ewes of a single cross, at 3 fr. 50c. each	1,400 00
516 fleeces of ewes of a double cross, at 6 fr. 50c. each	3,354 00
108 fleeces of ewes of a third cross, at 10 fr. each	1,080 00
320 lbs. of lamb's wool, of a double cross, at 80c. per lb.	256 00
310 lbs. of lamb's wool, of a third cross, at 1 fr. 20c. per lb.	372 00
30 lbs. of lamb's wool, of a fourth cross, at 1 fr. 40c. per lb.	42 00
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	12,472 00
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EIGHTH YEAR.

Sale of 80 ewes of a single cross, at 16 fr. each	1,280 00
do. of 62 ewes of a double cross, at 20 fr. each	1,240 00
do. of 6 ewes of a third cross, at 30 fr. each	180 00
do. of 160 wethers of a double cross, at 12 fr. each	1,920 00
do. of 125 wethers of a third cross, at 18 fr. each	2,250 00
do. of 12 wethers of a fourth cross, at 24 fr. each	288 00
384 fleeces of ewes of a single cross, at 3 fr. 50c. each	1,344 00
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	8,502 00
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	<i>Brought forward</i>	8,502f 00c
676 fleeces of ewes of a double cross, at 6 fr. 50c. each		4,394 00
227 fleeces of ewes of a third cross, at 10 fr. each		2,270 00
12 fleeces of ewes of a fourth cross, at 14 fr. each		168 00
308 lbs. of lamb's wool, of a double cross, at 80c. per lb		246 40
410 lbs. of lamb's wool, of a third cross, at 1 fr. 20c. per lb		492 00
100 lbs. of lamb's wool, of a fourth cross, at 1 fr. 40c. per lb		140 00
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		16,212 40

NINTH YEAR.

Sale of 73 ewes of a single cross, at 16 fr. each	1,168f 00c
do. of 82 ewes of a double cross, at 20 fr. each	1,640 00
do. of 20 ewes of a third cross, at 30 fr. each	600 00
do. of 154 wethers of a double cross, at 12 fr. each	1,848 00
do. of 164 wethers of a third cross, at 18 fr. each	2,952 00
do. of 40 wethers of a fourth cross, at 24 fr. each	960 00
311 fleeces of ewes of a single cross, at 3 fr 50c each	1,088 50
830 fleeces of ewes of a double cross, at 6 fr. 50c. each	5,395 00
377 fleeces of ewes of a third cross, at 10 fr. each	3,770 00
52 fleeces of ewes of a fourth cross, at 14 fr. each	728 00
258 lbs. of lamb's wool, of a double cross, at 80c. per lb	206 40
490 lbs. of lamb's wool, of a third cross, at 1 fr. 20c. per lb	588 00
210 lbs. of lamb's wool, of a fourth cross, at 1 fr. 40c. per lb	294 00
15 lbs. of lamb's wool, of a fifth cross, at 1 fr. 40c. per lb	21 00
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	21,258 90

Product of the Manure, at 1 fr. 50 cent. per sheep and 75 cent. per lamb.

1st year	1,050f 00c
2d —	832 50
3d —	867 00
4th —	955 00
5th —	1,372 00
6th —	1,575 00
7th —	1,563 00
8th —	1,881 00
9th —	2,148 00
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	12,243 50

SUMS OF THE RECEIPTS.

SALE <i>Of wool and animals.</i>		PRODUCT <i>of the manure.</i>		SUMS <i>Total.</i>	
	fr.	c.	fr.	c.	
1st year . . .	1,160		1,050		2,210
2d — . . .	3,820		832	50	4,652 50
3d — . . .	3,739	70	867		4,606 70
4th — . . .	5,511	10	955		6,469 10
5th — . . .	7,101		1,372		8,473
6th — . . .	9,941	70	1,575		11,516 70
7th — . . .	12,172		1,563		14,035
8th — . . .	16,212	40	1,881		18,093 40
9th — . . .	21,258	90	2,148		23,406 90
	81,219	80	12,243	50	93,463 30

Food for the Flock during the winter.

The food requisite for a sheep, during four months in the winter season, at fifty leagues from Paris, may be estimated at two pounds of hay each day and one bushel of oats for the four months, for a full grown animal, and half that quantity for a lamb.

A sheep then will consume, during those four months, two hundred and forty pounds of hay and one bushel of oats.*. A lamb will consume one hundred and twenty pounds of hay and half a bushel of oats.

If a bundle of hay be rated at eleven pounds weight, for it usually weighs from ten to twelve pounds, a sheep will consume twenty one bundles in four months; which, at 20 fr. for a hundred bundles, amounts to 4l 20c

It will also consume a bushel of oats: which, at 9 fr. for twelve bushels, comes to 0 75

4 95

* Instead of a bushel of oats, other grains may be given, as pease, vetches, barley, rye, wheat, &c. or a double quantity of roots, as they are less nutritive, viz. Jerusalem-artichokes, carrots, turnips, beets, potatoes: the cheapest articles should always be chosen. I also take for granted that farmers will not fail to give straw, of which creatures eat a part, and in which they find some grain. As this straw is obtained on the farm, and as it does not sell at a distance from cities, this part of the food is not to be taken into the account of the farmer's expense.

The food therefore of a sheep, during four months in the cold season, will amount to	. . . . .	f. c.
And that of a lamb, to	. . . . .	4 95
		2 48
		<u>7 43</u>

FIRST YEAR.

500 sheep at 4 fr. 95c.	. . . . .	2,475 00
400 lambs at 2 fr. 48c.	. . . . .	992 00
		<u>3,467 00</u>

SECOND YEAR.

400 sheep at 4 fr. 95c.	. . . . .	1,980 00
310 lambs at 2 fr. 48c.	. . . . .	768 80
		<u>2,748 80</u>

THIRD YEAR.

310 sheep at 4 fr. 95c.	. . . . .	1,534 50c
200 other sheep at 4 fr. 95c.	. . . . .	990 00
248 lambs at 2 fr. 48c.	. . . . .	615 04
160 other lambs at 2 fr. 48c.	. . . . .	396 80
		<u>3,536 34</u>

FOURTH YEAR.

563 sheep at 4 fr. 95c.	. . . . .	3,186 85
452 lambs at 2 fr. 48c.	. . . . .	1,120 96
		<u>4,307 81</u>

FIFTH YEAR.

656 sheep at 4 fr. 95c.	. . . . .	3,207 20
524 lambs at 2 fr. 48c.	. . . . .	1,299 52
		<u>4,506 72</u>

SIXTH YEAR.

750 sheep at 4 fr. 95c.	. . . . .	3,722 50
600 lambs at 2 fr. 48c.	. . . . .	1,488 00
		<u>5,210 50</u>

SEVENTH YEAR.

744 sheep at 4 fr. 95c.	. . . . .	3,682 80
594 lambs at 2 fr. 48c.	. . . . .	1,473 12
		<u>5,155 92</u>

EIGHTH YEAR.

896 sheep at 4 fr. 95c.	. . . . .	4,435 20
716 lambs at 2 fr. 48c.	. . . . .	1,775 68
		<u>6,210 88</u>

NINTH YEAR.

1,018 sheep at 4 fr. 95c.	. . . . .	5,039 10
828 lambs at 2 fr. 48c.	. . . . .	1,893 44
		<u>6,932 54</u>

Sum total of the winter food for a flock during nine years 42,076 51

Annual number of lambs which pay either 50c. or one frank.

2d year.	210 at 50 cent.	. . . . .	105f
3d —	408 do	. . . . .	204
4th —	452 do	. . . . .	226
5th —	524 at 1 fr.	. . . . .	524
6th —	600 do	. . . . .	600
7th —	594 do	. . . . .	594
8th —	716 do	. . . . .	716
9th —	828 do	. . . . .	828
			<u>3,797</u>

Wages and food of the Shepherds, at the rate of 400 franks each.

1st and 2d years.	3 shepherds	. . . . .	2,400f
3d year	3 do	. . . . .	1 200
4th and 5th years.	4 do	. . . . .	3,200
6th 7th and 8th do.	5 do	. . . . .	6,000
9th year	6 do	. . . . .	2,000
			<u>14,800</u>

Amount of expenses as follows :

Interest, at five per c. of 6,000f for nine years	2,700 00
Food for the flock	42,076 71
Lambs which pay 50c. or 1 fr.	3,997 00
Expense for shepherds	14,800 00

Sum Total 63,373 51

Balance.

The receipts of the farmer amount to	93,463f 30c
His disbursements amount to	63,373 51

Profits of the farmer 30,089 79

If the proceeds of the sale of the fleeces of the Spanish rams be given to the farmer, the amount of these proceeds year by year will be as follows.

The fleece of each ram is supposed to weigh ten pounds, at 2 franks.

1st year.	15 rams	300f
2d —	15 —	300
3d —	15 —	300
4th —	15 —	300
5th —	18 —	360
6th —	21 —	420
7th —	21 —	420
8th —	25 —	500
9th —	28 —	560
		<u>3,460</u>

If this sum be added to the above 30,089 fr. 79c. the profits of the farmer, the whole of his receipts will amount to 33,549 fr. 79 cent.

Emoluments of the Proprietor

The proprietor, at the expiration of nine years, becomes possessed of a flock of 2077 ewes, which, at an average of 40 fr. are worth

84,080f
He has received for the lambs, at 50c. or 1 fr. 3,797
Total <u>86,877</u>

Expenses of the Proprietor.

The providing of Rams, at the rate of about 3 to a hundred ewes, each ram serving six seasons.

1st, 2d, 3d and 4th years, 15 rams, at 200 fr.	3,000f
5th year, 3 rams more	600
6th do. do	600
7th do. renewal of the first 15 rams	3,000
8th do. 4 rams more	800
9th do. 3 more rams	600
Total	<u>8,600</u>

N. B. It is to be observed that the rams provided the 7th, 8th and 9th years will not be worn out. Some may still serve three seasons, other four, and the rest five; but this ought not to be taken into account, as it serves to compensate for those which die by accident or disease.

Payment made to the farmer for his first stock of ewes 6,000f
 For fodder, about 200

6,200

Sum of the Proprietor's Expenditures ; viz :

The providing of rams 8,600f
 Reimbursement of 6,000 fr. made to the farmer, and
 expense for fodder 6,200

Sum Total 14,800

Balance.

The receipts of the proprietor amount to 86,877
 His expenditures, to 14,800

To the proprietor there remains . 72,077

Second Scheme.

Supposing the proprietor to be at the expense of the first five hundred ewes and of the rams, while the farmer has only the profits arising from the ewes which are sold, from the wethers, the wool and the manure, during the nine years, and gives 50c for each lamb the 3d, 4th and 6th years, and 1 fr the remaining years; what will be the situation of the proprietor and of the farmer at the expiration of the contract?

Receipts of the Farmer.

Sale of wool and animals 81,219f 80c
 Value of the manure 12,243 50

93,463 30

Expenses of the Farmer.

Food for the flock 42,076 71
 Lambs which pay 50c. or 1 fr. 3,797 00
 Expenses for shepherds 14,800 00

60,673 71

Balance.

The receipts amount to	-	93,463f 30c
The expenses, amount to	-	60,673 71

There remains to the farmer . . . 32,789 59

N. B. By giving to the farmer the profits resulting from the wool of the Spanish rams, he would have 3,460 fr. more ; which, added to the 32,789 fr. 59c. make 36,242 fr. 52 centimes.

Receipts of the Proprietor.

2,077 ewes at 40 fr.	-	83,080f
Lambs at 50c. or 1 fr.	-	3,797
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		86,877

Expenses of the Proprietor.

For rams	-	8,600f
Purchase of 500 ewes	-	6,000
Fodder	-	200
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		14,800

Balance.

The receipts amount to	-	86,877f
The expenses amount to	-	14,800

There remains to the proprietor . . . 72,077

Third Scheme.

Supposing that the proprietor furnishes the first five hundred ewes and the rams ; that the wool, the proceeds of the ewes and wethers which are sold, as well as the flock at the end of the contract, are equally shared ; what will be the results to the proprietor and to the farmer at the expiration of the contract ?

Receipts of the Farmer.

The proceeds of the sales of the wool and animals amount to	-	81,219f 80c
The sale of the flock, at the end of the ninth year, may be estimated at	-	83,080 00
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		164,299 80

If from this sum be deducted 14,600 francs, the money advanced by the proprietor, for the purchase of the five hundred ewes with their rams, there will remain 149,699 francs 80 centimes, the half of which is

Profits obtained from the manure . . . 74,849f 90c

12,243 10

37,093 00

Expenses of the Farmer.

Food for the flock	-	-	-	-	42,076 71
Expenses for shepherds	-	-	-	-	14,800 00
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					56,876 71
					<hr/>

Balance.

The receipts amount to	-	-	-	-	87,093 00
The expenses amount to	-	-	-	-	56,876 71
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There remains to the farmer	-				30,216 29
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Receipts of the Proprietor.

Half the proceeds of the sales of the wool and animals, and half the value of the flock at the end of the ninth year, previous deduction being made of the sum he had advanced 74,849 90
 Sale of the wool of the Spanish rams - - 3,460 00

Sum of the receipts	78,309 90
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Expenses of the Proprietor.

Sum advanced for five hundred ewes together with rams for covering. But this article should here be considered merely as a memorandum, since the proprietor is supposed to have deducted this sum previously to the final partition.

Balance.

The receipts amount to	-	-	-	-	78,309f 90c
The expenses	-	-	-	-	mem
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Net profits of the proprietor	78,309 90
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Progressive flocks are also well suited to the three kinds of cheptel; they do not occasion any additional expense; but afford much greater profits during the continuance of the contract; and, at its expiration, a race of full-blooded sheep is obtained in place of a cross-bred flock.

OF COPULATION.

The rutting season cannot be the same in all parts of the country. Towards the south, spring is the time in which sheep are in heat; in the environs of Paris, it is the beginning of summer; and farther north, it is almost in autumn. A proprietor who wishes to make the most of his flock, must deviate more or less from the natural period, as his interest requires. The time of covering is regulated according to the seasons at which it is known that care can best be taken of the ewes when near weaning and while they are giving suck, and of the lambs when

they begin to eat and to grow. This is the general principle, which must vary in its application, according to the means of subsistence which can be afforded, the end which is proposed, and the climate in which the sheep are kept. For instance, if feed be most abundant in November or December,* the rams must be put to the ewes in June, July and August; they should be put to them in October or November, if in April or May there be abundance of grass in the fields. Other considerations, may also serve to determine the time of covering.

When ewes have been weakened by disease, they must be kept from the ram until they are perfectly restored to health; otherwise, they will be unable to conceive, or will produce abortions or sickly lambs.

During a year in which forage almost entirely failed, I have known farmers who, fearing that the expense of keeping their flocks through the winter would be too great, if the lambs were dropped early, delayed the time of covering, that the young ones might come more nearly at the season in which new grass was to be expected.

The ewes in a flock are not in heat all at once; the rams should consequently be left with them a sufficient time.— If we are to believe some persons, nine weeks are requisite, because, say they, as the ewes are in heat again at the end of twenty one days, there is more likelihood of their having all been covered during that time; an assertion which I do not warrant. There is an advantage in having all the lambs dropped within as short a time as possible; an inequality among them is thus avoided, which disfigures the flock, prevents the weak from defending themselves against the strong while at the rack, renders it necessary to rear a part of them separately, and occasions difficulties in weaning them. These considerations, which are weighty, do not however influence proprietors, who think it their interest to obtain from their flocks the greatest possible number of lambs which they can produce in the course of the year; it is usual for them not to separate all the rams from the ewes at the close of the rut, but to keep one at least among them, that those which are late in heat may take him at the end of the season. The lambs which are produced by these last copulations, and which in French are called *tardons* or *tardillons*, are easily reared, if care be taken of them and of their mothers; only they should not be permitted to propagate

* As in countries where they are nourished during the winter almost entirely with corn in sheaves.

within a year after the usual time ; all depends upon the importance which is attached to the multiplication of lambs.

Many farmers leave their rams the whole year round in the midst of their ewes; for the rams being no more in number than are necessary for covering, they think it too expensive to keep them separate. The consequence is that, the heat of the females being excited by the presence of the males, lambs are produced at almost all seasons: it would be better if the rams, after having been a sufficient time with the ewes, could be put in a flock of wethers. It would perhaps not be a bad speculation to establish in some part of the country a sort of boarding place, at which, for a reasonable price, rams might be received and taken care of during the time they are not used.

The choice of covering rams is a matter of importance ; I have shown how much influence they have upon the young breed.— The best may be distinguished by the following marks. A fine merino ram has a very lively eye, a regular and free gait, short ears, rough horns, a broad nape, short neck, round shoulders, a broad chest, full buttocks, large testicles long and pendent, fine wool, tufted, abundant, and homogeneous, that is, nearly the same upon all parts of the body. A large size is desirable; yet a ram that is not so tall, but stout and well made, is preferable to one that has only height. Goodness of make is the quality most to be desired. The soundness of the animal's health may be ascertained by examining the veins of the eye near the lachrymal glands. In full health, these veins are of a clear red ; this sign however, is not always to be depended upon. One may be more assured of the rams not being sick, if he does not shrink when the hand is pressed hard upon his rump, or if he struggles vigorously when held by one of his hind legs. The vermilion colour of the gums, the lips not being relaxed, the adhesion of the wool to the skin, are also indications of health.

The ram is able, at a year old, to engender; but it is better to wait until he is three, or at least two years old: if strong and healthy, he may be employed eight or ten years

An ewe, to be good, should have a large body, round buttocks, a broad back, a large bag, long teats, thin legs, a thick tail, fine wool, and, in short, should as nearly as possible possess the properties which distinguish a fine ram. She might be impregnated while yet a lamb; but good management requires that she be not suffered to take the ram before the age of

three years, or at least of two, provided she has been well reared and is vigorous. It has been observed that old ewes yield the finest lambs and are the best nurses.

Every other manner of employing male and female merinos in propagation, is contrary to the laws of animal economy and to the melioration of the breed.

The qualities which I have just mentioned are not to be found in all the rams nor in all the ewes of a full-blooded flock.—As very few rams are wanted, it is easy to select the best. As to ewes, it is not so necessary that they should be of the first rate, in order to yield fine lambs; it is sufficient to give them well chosen rams of their own race, and that their wool be fine.—Some ewes have very fine lambs, at one time, and such as are inferior, at another: but these are exceptions which do not militate against the general rule that the finest individuals in each sex should be chosen for propagation. Vigour, in both, is of much importance: by unremitting attention to these things, a fine breed may constantly be kept up.

A ram deficient in one testicle and an ewe with but one teat, would be as capable of generating as those which are perfect in those parts: yet, in order to avoid all risque, it would be better to prevent them from copulating. Rams with both testicles entire have been found incapable of generating, without any apparent cause of this incapacity; these instances are extremely rare.

Some blemishes in the mothers are not communicated to their young; an ewe that has but one eye, especially if this has been caused by disease or accident, produces a lamb with two perfect eyes: the same thing happens in the case of a lame ewe. It would be wrong to reject them. Some lambs have reddish, others have black spots: the former disappear as the wool grows; the black are more durable, they appear to be in the skin. Some are entirely black, or rather of soot colour, although their parents were not so. In the course of twenty years, this has happened five times at Rambouillet, although the flock has never had communication with any other; being kept separate, in a park surrounded by walls, where no strange beast is suffered to enter. The ewes which were of that colour produced lambs quite white. To what can this extraordinary circumstance be attributed! I am at a loss to determine: the general unwillingness, however, to purchase animals thus stained cannot be blamed: it is better to err on the side of caution than of negligence. Caution has been carried so far as to reject

rams which have black marks upon their tongues and in their mouths, which often happens. However ancient the opinion may be, that they produce black lambs, I am not the less inclined think it ill founded: *Gilbert* has proved the contrary.

When the ewes of a flock begin to be in heat, while the number of those which in that state is small, only a part of the rams should be put among them; more should be added as the heat of the ewes increases, and they should be removed gradually as it diminishes.

A single ram is able to impregnate a considerable number of females, in a short time. Instances are mentioned which can hardly be believed. One should not however trust to this possibility. In France, one ram is commonly allowed for fifty ewes: The Spaniards go as far as four to a hundred.—By putting three to a hundred females, as I do in my flock, the rams are not worn down, they last a long while, and fine lambs are obtained from them.

Some proprietors, through all the rutting season, leave the rams and the ewes together only during the night, and separate them in the morning: this management implies that the heat of the ewes is less in the day than at night, which is by no means certain: by adopting it, there is danger that this heat may cease or be diminished. It is excited by the constant presence of the rams; who take advantage of it at the most favourable moment.

Others divide into two equal parts the whole number of rams destined to serve, and employ at first only one half, which they withdraw at the end of some days, and supply their place by the other half; when these have remained the same length of time, they are taken away, and succeeded by the former half, and thus alternately. By this method, the rams have intervals of rest which renew their vigour. Another advantage results from it, which is that they are less apt to fight with each other; it is known that their battles sometimes occasion losses even among the ewes when they chance to get between two angry rams. Besides, when they are very numerous, some through jealousy, overthrow others while in the act of copulation, which they thus render fruitless.

In most countries, it is usual to give the rams, some time before the covering season, a more than ordinary quantity of food, and to continue it two or three weeks afterwards, in order to strengthen them and repair their waste. This pro-

caution is useless, if they be constantly supplied with sufficient nourishment.

During the rutting seasons, a separate flock should be formed of the young females which are intended to be kept from the male until they are more fit to receive him. In order to save expense, two neighbouring farmers might agree to keep their young females together during the season.

If any young females are found pregnant, their lambs should be taken from them as soon as dropped, and put to their other ewes or to goats, or fed with cow's milk. Experience has proved that, as gestation causes less fatigue than nursing, those females which have been impregnated too young are not at all stunted in their growth, if their lambs be taken from them as soon as dropped.

Of Gestation and Yeaning.

It is commonly supposed that the ewe carries her young five months, or a hundred and fifty days; this is not always the case, some lambs are dropped earlier and others later. I have observed in my flock, that when the rams had been with the ewes from the first of July to the first of September, more than a tenth of the lambs were dropped before the end of December: the first lamb was born on the 25th of November, that is to say on the hundred and forty seventh day; all the other ewes, four excepted, brought forth their young in the month of December, which proves that they were in good health when they took the ram. It is said that the time is in some instances extended to a hundred and sixty days. In order to know precisely the two extremes and the true average time of gestation, accurate experiments would be necessary, which are not easy to be made, on account of the great number of females in a flock, and because a ram may cover the same ewe more than once.

All the ewes in a flock do not conceive, and many miscarry. In flocks which are well kept and well tended, the number of lambs about equals that of the ewes which have taken the ram, because there are twin births more than enough to compensate for the abortions and the lambs which die. I know one flock in which, during five years, a clear average of five hundred and seventeen lambs has been obtained from four hundred and thirty eight ewes. It sometimes happens that, notwithstanding every care, there is a certain number of ewes which do not bear young: in a flock, belonging to a person in the neighbourhood of Paris, consisting of a hundred and ninety

one ewes, nineteen had no lambs; seven of them were old, and the other twelve young: the summer had been very rainy, and the flock had been folded in almost every kind of weather. This circumstance, the proprietor supposed, might have occasioned the failure.

Abortion may be occasioned by several different causes; some of which are natural and others accidental. The natural, which seem to me never to have been taken into consideration, are the temperament and particular constitution of the females. A vigorous female, may miscarry because the blood tends in too great quantities and with too much violence, towards the vessels of the matrix, and loosens the placenta; one that is feeble, because she does not furnish blood enough for the support of the fœtus. The placenta may be separated from the matrix, as fruits from trees, either when the juices are supplied too abundantly and with too much force, or when they are not afforded in sufficient quantities. These two causes may be counteracted by bleeding the animal that is too strong and sanguine, or by giving it less food, and by strengthening the one that is of a contrary habit.

Several accidental causes produce abortion. The following are the principal: acute or chronic diseases; a forced or long journey; violent or sudden movements; food, in too great or in too small quantities or that is spoiled; bad weather; blows upon the belly, the sides or the reins; certain herbs which affect the matrix; fright; a sheep-house whose doors are narrow and whose posts are sharp-cornered. The mere detail of these causes, shows that they may almost all be avoided; and is sufficient to indicate the precautions which should be employed.

I shall say nothing concerning the influence which some authors have supposed the imaginations of pregnant ewes to have upon their young. I will not do so much injustice to the good sense of my readers as to suspect that they can regret my passing this subject over in silence.

It is advisable to give an extraordinary quantity of food to the pregnant ewes a month or two before they year, that the fœtus may be enabled then to grow rapidly without injuring the health of the mother.

About yearning time, those which are great with young should be separated, during the night, from the others; they may easily be distinguished by the state of their bellies and of their udders: the best pastures should be for the pregnant ewes.

When a female is near bringing forth, the natural parts swell, watery humours flow from the orifice of the womb, and the udder is filled with milk. These symptoms, which are faint at first, become stronger as the time of yeaning approaches; then, if the season be severe, the creatures should be kept housed.

The young are generally brought forth without any difficulty; nature alone operates, and art is useless. Sometimes, however, on account of the position and size of the fœtus or the condition of the mother, the young are produced with great labour, and aid is requisite, according to the nature of the circumstances. See the article *Shepherd*.

The ewes which give suck should be treated in the same manner as those which are in the last months of their pregnancy; that is, they should be well fed, that their milk may be of a good quality and in sufficient quantity.

Some ewes produce twins. An attentive proprietor remarks these females, with the view of retaining them a long time in his flock; they are profitable; they are not sooner exhausted than others, and many of them rear both their young ones very well. I have known one which lived twenty years, bore every year, and often had two lambs at a time. If the mother of twins is too weak to nurse them both, one is to be left with her, and the other killed or suckled by a cow or a goat, or by an ewe which has just lost its lamb. If an ewe has two lambs neither of which will suck any female except its mother, one of them must be fed, by means of a sucking-bottle, with very thin pap made of wheat flour, water and a little cow's milk warmed.

Althought twin births are not usual, yet they are by no means rare. I am confident that in a flock of three hundred and seventy one bearing ewes there have been twenty two twin births, which is more than a seventeenth.

It is strange that a belief should ever have been entertained of its being improper to let lambs suck the first milk of their mothers, as being injurious; in countries where this opinion prevails, the shepherd presses the udder with his fingers and wastes the milk upon the ground. This is a manifest error, for it is known that the first milk of females of every species is always adapted to the feeble condition of their young, and that it is destined by nature to evacuate the *meconium*, that is, the excrements contained in the stomach and intestines

If one attentively observes what passes in a sheep-house during the season of yeaning, it may be seen that the new-dropped lambs crowd together and get into those places which are most sheltered from the cold: they are directed by nature alone; lambs have often died in sheep-houses, for want of sufficient warmth. A still greater number would have perished, if the ewes had dropped them in the open air or only under sheds.—The stronger ones might have survived, but the weaker would have died; in a better situation and with more care, they would have been reared and have thriven, thus increasing the profits of the proprietor, who gains in proportion to the number of lambs which he has.

These remarks serve to shew that the houses for sheep, if they yean in winter, should be of a mild temperature; without, however, being very warm; so that they may be compatible with the health both of the ewes and of their lambs. When treating of houses for sheep. I shall explain the manner in which they ought to be constructed in order to obtain this end.

If ewes are milked while they give suck, it is done at the expense of the lambs; they are deprived of a part of the milk which belongs to them, by which they suffer much injury. This practice, which prevails in the south, where none but sheep's and goat's milk is used, seems there to hinder the propagation of merinos; the evil, however, may be counteracted by giving more food to the ewes, by not beginning to milk them until they have given suck three or four months, by not continuing more than three months to take their milk, and by ceasing to do so as soon as they are in heat.

Some lambs will eat at the age of three weeks. While their dams are in the fields, food should be given to them, suited to their tender age and to the condition of their teeth, such as grain pounded or ground, and tender grass.

That they may gain strength, they should, from time to time, be let out near the house, during the day, when the weather is fine. Their gambols in the open air give them an appetite and make their limbs grow.

The proprietors of large flocks do well in keeping apart, for some time after the season of yeaning, the young females which have not borne. The young lambs, by sucking them instead of their mothers, would fatigue them and prevent them from growing. In general, if one can afford the expense, it is bet

ter to have a shepherd extraordinary, to tend during the whole year the ewes-lambs and tnaives.

Of Weaning.

If the lambs were suddenly weaned, there would be a risque of causing a dangerous disease among the mothers, from a repletion of their udders; and the lambs themselves would suffer much from the sudden privation of a nourishment which they are fond of and to which they are accustomed; it is therefore necessary that the weaning, for the sake of both the mothers and their young ones, be performed gradually. At first, the lambs should not be suffered to suck during the whole day and the whole night; then, they should be indulged during the night only; then, they should be separated from their mothers at night, and put with them only once or twice in the course of the day; and, at length, they should be separated from them altogether: they forget each other, and the milk dries away insensibly.

When the lambs are dropped late, that is, near the season in which the grass appears in the fields, they may be weaned at the age of two months; if they come early, in December or January, for instance, the weaning should be deferred. In this case, it should not be before they are four or five months old, according to their strength and the abundance of food which they can find in the pastures. As they are not all dropped at the same time, more than a month sometimes elapsing between the first and last, it is necessary to wean them successively.

If the male lambs were to remain with their dams and with female lambs after they are able to generate, which happens at the age of five or six months, there would be a risque of the young females getting with lamb; their products would be but very feeble; the young rams would enervate themselves; and the young females would no longer be of service. By separating them betimes, all these disadvantages are avoided.

Of Docking.

It was not customary in France to dock sheep; but since the introduction of merinos this practice has been adopted, in imitation of the Spaniards, by the proprietors of flocks of that race. Several considerations render it advisable: 1. in many countries, at certain seasons, sheep that live upon young grass are subject to a lax, by which their tails become very foul, and in their turn dirty the wool on the thighs; 2. soft earth would also adhere to them; 3. the udder of the females, distended by

the milk when they give suck, would become tender and painful if struck by a tail loaded with dirt. It has been said that cutting off the tail strengthens the reins; for the truth of which assertion I will not vouch. Ewes upon whom this operation has been performed while young, take the male better, and lamb without getting the umbilical cord entangled: these reasons are sufficient to recommend this practice.

The tails of lambs should be cut off at the age of one or two months. The shepherd takes them one after another between his legs; with his knife he cuts the tail off at three or four inches from its origin: it would be dangerous to cut nearer, as lambs have sometimes died in consequence of it. In the parts of females were too much uncovered, certain species of flies might deposit their eggs there, and breed worms, as I have myself remarked. When the operation is performed, the animal is let loose without any application upon the wound, which bleeds a little and quickly heals up.

Of Castration.

Before the multiplication of merinos, it was not usual to castrate a male lamb on account of any defect, he was employed like others in generating; since the number has increased, the proprietors of fine flocks castrate only those lambs which are unpromising, or for which they do not expect to get a reasonable price. It has already become an object of speculation to form flocks of full blooded merino wethers: they are bought during the first or second year of their age; they may be fed at less expence than ewes; they are kept four or five years for the sake of their manure and of their fleeces, which are very heavy; with a trifling expence, they may be fattened and sold for nearly as much as their original cost. Proprietors or farmers whose grounds are too wet to admit of rearing lambs, would find it advantageous to procure merino wethers, and to sell them as soon as fat. At some future day the markets will be filled by them, as they have hitherto been by common wethers: they are already to be seen there in considerable numbers.

Rams may be castrated at any age; if they be castrated while lambs, it should be done from three weeks old to six months: the sooner this operation is performed, the less they suffer and the less is the risque of losing them. It should be done before they are weaned; the milk of their mothers serves both to nourish them and to assuage their pain. They are commonly castrated at the age of three weeks or a month, when the testicles have descended into the scrotum.

The best method of castrating is, entirely to take away the testicles. An incision is made in the lower part of the scrotum; the testicles are separately drawn out; the operator seizes them one after the other in his teeth, and bites them off; and he twists the cord, which yields and may be drawn with ease.—Some people rub the scrotum afterwards with hog's lard; others merely close the wound. The flesh of an animal deprived of these organs, before they have served for the secretion of seed, is very fine and delicate.

This method would not answer for rams of three or four years old; they could hardly endure it. They must be *twisted* or *whipped*.* The first of these two operations consists in seizing the testicles and twisting them so hard as to render them incapable of secreting the seminal liquor. As they are supposed to be twisted twice round, the operation is in French called *bistourner*. The testicles are made to ascend; a tie is made below them, to prevent them from descending, and at the end of few days the ligature is removed.

The second operation takes its name from *whip cord* (*fouet*) a sort of strong packthread which is usually employed. To perform it, the feet of the animal are tied; the wool which covers the testicles is to be taken off by means of the fingers rather than of shears; in order to make them descend, the scrotum is rubbed; between them and the small nipples which rams have, is placed the packthread, which ought to be very strong. A knot is made, in which the testicles are inserted; each end of the packthread is fastened to a piece of wood held by a man: the knot is drawn, and the two men pull as hard as they can, without giving any jerks and without cutting the strings of the testicles. A second knot is made, and drawn equally tight; the packthread is cut off, so as to leave an inch and a half: if, in pulling, it breaks, another must be substituted and employed in the same manner, without taking off the former. Care should be taken not to injure the penis, in order to avoid bringing on a *phimosi*s.

Shepherds are, in general, acquainted with the three above mentioned methods; some of them are so expert, that of a hundred male lambs which they castrate, sometimes not one dies. In some countries, men called *gelders* go round to the different farms, at certain times, to perform this operation: they are very careful, after having performed it, to put their fingers in the mouth of the animal, in order to make it move

* The French words for these operations are *bistourner* and *fouetter*.

its jaws and thus be preserved from the tetanus, which would kill it ; this method succeeds.

The flesh of *twisted* or *whipped* wethers is not so well flavoured as the flesh of those whose testicles were taken out whilst they were young.

The luxury of the table has some times been the occasion of castrating ewes, by taking away their ovaries ; their meat is in this way improved ; this operation is more difficult than the castration of males. The quantity of the wool is not increased by it, neither is it rendered finer ; in these last two respects it is quite useless.

Of cutting off the horns.

The horns which nature has given to the merino rams, apparently as means of defence and attack, become, in the domestic state not only useless to him, but even inconvenient and hurtful ; they prevent him from putting his head between the bars of the rack to get at his food ; frequently they wound the ewes in going through gates or doors ; and the rams themselves often suffer from them in their battles with each other, in which they sometimes are killed upon the spot. Sometimes the horns are curved in such a manner as to enter the head of the animal on which they grow. Although some of these inconveniences do not affect the migrating flocks, since they do not eat from racks and have no folds, yet the Spaniards do not fail to cut off the horns of their rams. Among us, there is much unwillingness to adopt this practice, because it is thought that the beauty of a merino ram depends much upon his horns : and those are even sometimes rejected which are born without them, however pure their race may be, through fear of their being taken for mongrels.

There are two methods of cutting off the horns ; in one, a saw is employed ; and in the other, a chisel. A sharp hand-saw answers very well. One man holds the head of the ram firmly, another uses the saw, and the operation is performed in a moment : a rope turned twice round the horn and drawn rapidly, produces the same effect.

The amputation by means of a chisel is a less simple method ; I have seen this practised by Spanish shepherds. A hole is dug, of 5 or 6 inches deep and of the length and breadth of a ram ; a second hole, not so wide, is dug across one end of the former : in this latter, which is not deep, a plank is laid to

support the head of the ram ; he is thrown upon his back in the larger hole ; one man keeps down the animal's head firmly upon the plank, while another holds a long chisel, weighing two or two and a half kilogrammes, which he places upon the horn, and on which a third strikes with a wooden mallet, which is sufficient to take fairly off the part which it is intended to amputate. The preparation which this method requires renders the saw preferable.

The horns of rams are cut when animals are a year old ; they shoot out again, but never become so long as at first : sometimes it is necessary to renew the operation, if they again become troublesome.

Of Marking Sheep.

The shepherd of a small flock which is stationary requires no marks by which to know each sheep. When the flock is large, some marks are necessary, if he would avoid mistakes — They are indispensably requisite when the flock is composed of sheep belonging to different proprietors, especially at the time of folding, and still more so when they are conducted to mountains and from place to place.

Sheep are marked on various parts of the body ; on the face, in the ear, on the nape of the neck, between the shoulders, on the buttocks and on the sides. The most durable marks are those made on the face with a hot iron, and in the ear by cutting a hole in it : the others, being made only upon the wool, are effaced by the oily matter that oozes from it, by the rain, the dust or the mud ; at shearing time, it is necessary to renew them. For these latter marks, a black, red, yellow or blue colour is employed. The black is a mixture of lampblack and oil ; the blue is made with indigo ; the red and the yellow, with ochre, oil and a little meal. In some countries it is usual to stain only one tuft of the longest wool, to interlace it with a tuft of white wool, and to make a knot at the ends ; this cannot be done until some time after shearing. The Spaniards use melted pitch, which they apply to the animal's side, by means of an iron having the form of a cipher of the initial letters of the proprietor's name. This method of marking has been adopted by some persons in France. All marks, except those made on the face and in the ears, do a partial injury, more or less staining the wool ; but marks of some kind are indispensably necessary, to prevent confusion. Those made by the cipher cannot be imitated, which is a great advantage. In Spain, the laws severely punish a person for taking the mark of another : it would be well