

A GUIDE FOR SHEEP AND FARM LIFE

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A Breeding Strategy for Small Flocks

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Introduction: Sheep breeders may find themselves faced with the dilemma of dealing with a small number of animals. For example, after an importation or introduction of a small number of animals of a new genetic material, or when they are forced to close their flocks and breed from within for a period of time to avoid introducing contagious diseases

into their flocks. In either case the breeders' worries are to maintain a healthy flock and keep inbreeding as low as possible to prevent its deleterious effect on reproduction and fitness. There is a limit to what a breeder can do under such circumstances. However, the knowledge of a simple method to design the breeding program

with the limited number of animals available should definitely help.

General Rules:

- Whenever possible, keep as many unrelated sires as good management permits. If the breeder is importing animals, it is more important to obtain a relatively larger number of males, one sire for each three ewes is not abnormal.

- Keep track of the pedigree of both males and females for as many generations back as possible, this information is essential in planning a successful mating scheme.

- Keeping tight control on mating and identifying progeny at lambing is essential for success in applying the proposed breeding plan.

G e	Yr.	Family A				Family B				Family C				
		G1	G2	G3	G4	G1	G2	G3	G4	G1	G2	G3	G4	
0		A x a				B x b					C x c			
1	1	AA (aa)				BB (bb)					CC (cc)			
	2	AA (aa)				BB (bb)					CC (cc)			
	3	AA (aa)				BB (bb)					CC (cc)			

A, B, C are the original rams; a, b, c are the original ewes; AA, BB, CC, aa, bb, cc are male and female progeny.

2	1	Cx (a)				A x (b)					B x (c)			
	2	CA (ca)				AB (ab)					BC (bc)			
	3	CA (ca)				AB (ab)					BC (bc)			

First generation of family crossing, all progeny keep the color of their dams, all males to be sent for meat.

3	1	B x (ca)				C x (ab)					A x (bc)			
	2	BCA bca				CAB cab					ABC abc			
	3	BCA bca				CAB cab					ABC abc			

Second generation of family crossing. The progeny have genes from all sires, so far they are not inbred.

Procedures:

1. Divide your females into families according to their relationship with each other, for example, sisters, cousins, mothers and daughters are grouped together.

2. Assign a color for each family. All animals born to ewes in a family will carry the same color, the same for their progeny.

3. Select the rams for each family from those least related; they should carry the same family color. If the number of rams is limited, each family can be sired by only one ram; if several sires are available, more than one sire can be assigned to each family.

Preferably, related sires should mate ewes of the same family.

4. As shown in the following scheme, mate the sires of each family with the ewes assigned to that family as long as they remain productive. These matings will produce the males to be used on ewes of the other families. The ewes born within a family will be bred by rams from the previous family.

5. The males produced from this first crossing between families will not be used for mating and should be sold for meat. The females, all a combination of two families, should be used for replacement.

6. As is the case with the original animals, repeat this mating until the females are no longer productive.

7. The two-family-cross ewes should be mated to rams from the third family, again all males are sold, and fit females are raised for replacement.

In the following example only three families were created. If a fourth or fifth sire was available, a fourth (D) and a fifth (E) family can be created and inbreeding can be delayed for another one or two generations. However, in the example, the breeder will have no choice but to rebreed his females of the third generation with sires from the same color, and that is when inbreeding will come into the picture. That is why the delay in inbreeding is proportionate to the number of sires (families) used.

					A x bca					B x cab					C x abc
4					ABCA abca					BCAB bach					CABC cabc
					etc.					etc.					etc.

Progeny of this mating will be inbred. However, if there were a fourth or fifth sire, inbreeding would be delayed for another one and two generations, respectively, and so on.

The separation of generations and years in the first breeding scheme was made for simplicity. In fact, generations are overlapping in the years since female progeny are normally mated as yearlings, so the next scheme is the more realistic one. It shows the complexity of the program.

Y r	Family A				Family B				Family C			
	G0	G1	G2	G3	G0	G1	G2	G3	G0	G1	G2	G3
0	A x a				B x b				C x c			
1	AA (aa)	Cx (a)			BB (bb)	Ax (b)			CC (cc)	Bx (c)		
2	AA (aa)	CA (ca)	Bx (ca)		BB (bb)	AB (ab)	Cx (ab)		CC (cc)	BC (bc)	Ax (bc)	
3	AA (aa)	CA (ca)	BCA bca	Ax bca	BB (bb)	AB (ab)	CAB cab	Bx cab	CC (cc)	BC (bc)	ABC abc	Cx abc
4		CA (ca)	BCA bca	ABCA abca		AB (ab)	CAB cab	BCAB bach		BC (bc)	ABC abc	CABC cabc
5			BCA bca	ABCA abca			CAB cab	BCAB bach			ABC abc	CABC cabc
6				ABCA abca				BCAB bach				CABC cabc

As can be shown, the essential element for the success of this scheme is the proper identification of the progeny and assigning the proper sires for mating.