



Parentage assignment with molecular markers in sheep :

Preliminary results and prospects

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Parentage assignment in sheep?

- ▶ **Different consequences of "paternity mating":**
 - ▶ Work overload and organizational constraints for breeders.
-- > A decrease in the number of breeders
- ▶ **A strong demand from Breeders Associations.**
- ▶ **Several aspects considered :**
 - ▶ Lower fertility : is it true?
 - ▶ Characteristics of the group of putative sires





Parentage assignment in sheep?

▶ Material and methods

- ▶ Molecular markers (13 microsats)
- ▶ Parentage Assignment Software
 - Based on likelihood between a lamb and his potential parents
- ▶ DNA from actual mating plans





Parentage assignment in sheep?

Hetero-spermic AI Experiment

Natural mating Experiment

23 Farms
2478 EWES – 46 AI RAMS

7 Farms 1529 EWES – 68 RAMS

Mono-spermic AI
1442 ewes

Hetero-spermic AI
1036 ewes

Single-ram mating
691 ewes

multi-ram mating
838 ewes

DNA collected and analysed





Results - Fertility

▶ hetero-spermic AI experiment :

- ▶ Low fertility
- ▶ Very high variability among batches
- ▶ No statistic difference

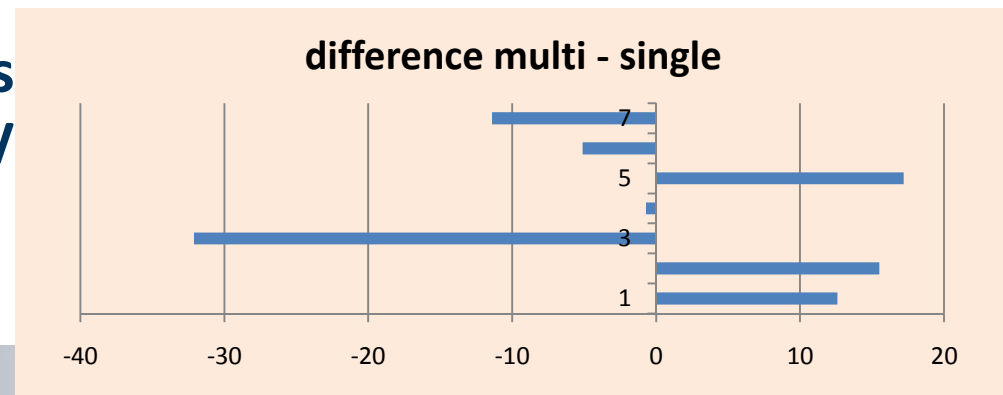
▶ Multi-rams mating experiment :

- ▶ Very high variability among farms
- ▶ No statistic difference

AI	Nb. of ewes	Fertility
Global	2478	49,9%
Hetero-S AI	1442	48,1%
Mono-S AI	1036	51,2%

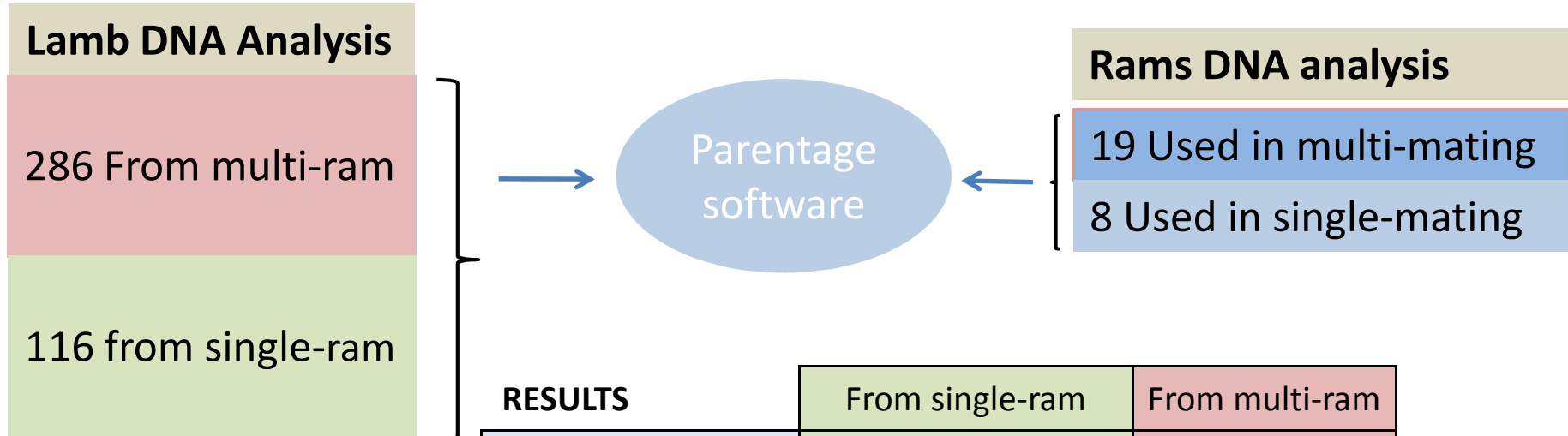
Natural	Nb. of ewes	Fertility
Global	1529	69,0%
multi-Ram	838	67,1%
Single-Ram	691	71,3%

→ A large number of results is needed to conclude on fertility



Parentage assignment in sheep?

Assignment rate estimation



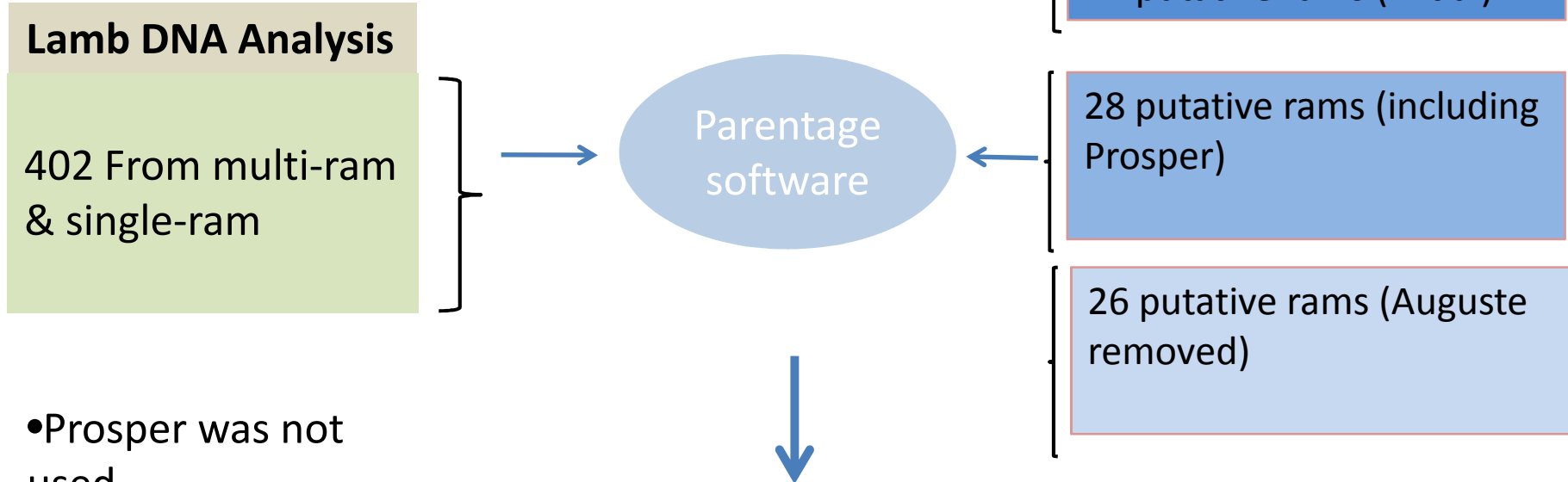
RESULTS	From single-ram	From multi-ram
Number of samples	116	286
Assigned correct	108 (93%)	258 90%
Assigned uncorrect	1 (1%)	
Poly/non assigned	7 6%	28 10%





Parentage assignment in sheep?

► Consequences of a relationship between proposed rams ?



- Prosper was not used.
- Prosper is the half-brother of Auguste.
- Auguste was an actual sire.

Results:
- Analysis of 34 multi-ram lambs initially assigned to Auguste.

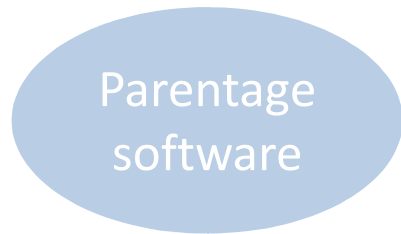




Parentage assignment in sheep?

Consequences of a relationship between putative rams ?

Lamb DNA Analysis
402 From multi-ram & single-ram



Rams DNA analysis

27 putative rams (initial)

28 putative rams (including Prosper)

26 putative rams (Auguste removed)

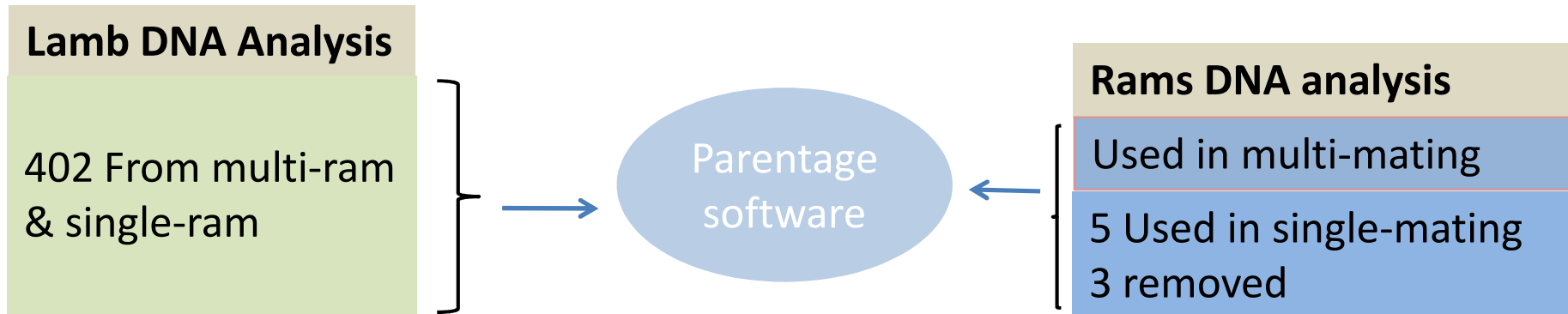
	Putative rams : 26 « other rams » (or) and :				
	+ Auguste	Auguste + Prosper		+ Prosper and without Auguste	
Products assigned to Auguste in the initial test	34	A.	31	-	13
				P.	11
				or	3
				P.&or	1
		or&or	3		
		A.& P.	3	P.	3





Parentage assignment in sheep?

► Consequences of a missing ram in the list of putative rams?



All rams (8)		5 rams (3 removed)			Lower threshold
Assigned to an unique sire	108	5 remaining rams – (66 lambs)	Uncorrect	1	3
			Well-assigned	65	63
		3 removed rams – (42 lambs)	Assigned	14	9
			Non assigned	28	33





Conclusion

- ▶ **A first experience on parentage assignment in French sheep breeds.**
- ▶ **Two important factors :**
 - ▶ Of course the markers panel efficiency
 - ▶ Structure of the data
- ▶ **On-going : technical and economic impacts on genetic scheme and genetic progress.**





Parentage assignment in sheep

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