

SUPPLEMENTAL TABLES

TABLE S1. Percentage Recovery, Standard Deviation and Relative Standard Deviation of Triplicates run with SpermX for LAB 1.

S1.1. Average Percentage Recovery for the triplicate epithelial fractions (E) and sperm fractions (S) for mixtures A-D.

Mixture	Expected Target		Average Observed target		Average Percentage Recovered	
	Female (ng)	Male (ng)	Female (ng)	Male (ng)	E	S
A	1000	10	785.6	7	78.56	70.00
B	2500	2.5	1816.3	1.6	72.65	64.00
C	5000	5	3736.3	3.6	74.73	72.00
D	7500	10	5152.7	6.2	68.70	62.00
E	1500	2.5	1233.403	2.039	82.23	81.56
F	1500	1.25	1117.611	0.752	74.51	60.16
G	1500	0.33	1025.002	0.202	68.33	61.21
H	1500	0.0825	1318.198	0.054	87.88	65.45

S1.2. Standard Deviation (SD) and Relative Standard Deviation (RSD) of the triplicate DNA recoveries for the epithelial fractions (E) and sperm fractions (S).

Mixture	SD (E)	RSD % (E)	SD (S)	RSD % (S)
A	60.75	7.73	0.48	6.80
B	311.17	17.13	0.19	11.87
C	193.64	5.18	0.43	11.86
D	1799.19	34.92	0.64	10.28
E	220.59	17.88	0.31	15.36
F	60.03	5.37	0.19	25.24
G	85.60	8.35	0.09	42.87
H	184.29	13.98	0.01	8.22

TABLE S2. Statistical significance for the total Y DNA recovery in the sperm fractions comparison of the SX and DE for each laboratory (alpha = 0.05). Data in Figures 1 and 2.

Mixture	Lab	Significance(Y/N)	P stat (one tail)
A	2	N (large variances)	0.106
	3	Y	0.011
B	2	Y	<0.001
	3	N	0.080
C	2	Y	0.001
	3	N	0.055
D	2	Y	0.035
	3	N	0.233
E	1	Y	<0.001
	2	Y	0.002
	3	Y	<0.001
F	1	Y	0.006
	2	Y	0.038
	3	Y	0.009
G	1	Y	0.018
	2	N	0.275
	3	N	0.082
H	1	N	0.087
	2	N	0.133
	3	Y	0.038

TABLE S3. Fold differences in total Y DNA (SX/DE) in the sperm fractions and lab averages. Data in Figures 1 and 2.

Mixture	Lab	Fold Difference	Average
A	1	N/A	5.9
	2	6.1	
	3	5.8	
B	1	N/A	2.5
	2	2.7	
	3	2.2	
C	1	N/A	3.0
	2	3.5	
	3	2.5	
D	1	N/A	1.5
	2	1.6	
	3	1.4	
E	1	3.8	5.0
	2	9.4	
	3	1.8	
F	1	2.9	2.8
	2	3.8	
	3	1.8	
G	1	5.5	4.1
	2	5.5	
	3	1.3	
H	1	7.2	12.6
	2	23.0	
	3	7.7	

TABLE S4. Fold difference in S/Y ratios (DE/SX) in the sperm fractions and lab averages. Data in Figure 3.

Mixture	Lab	Fold Difference	Average
A	1	N/A	7.2
	2	9.3	
	3	5.1	
B	1	N/A	13.9
	2	19.4	
	3	8.5	
C	1	N/A	6.6
	2	6.4	
	3	6.7	
D	1	N/A	5.4
	2	4.5	
	3	6.2	
E	1	4.2	10.1
	2	17.8	
	3	8.5	
F	1	4.8	15.2
	2	29.2	
	3	11.5	
G	1	4.8	9.0
	2	11.0	
	3	11.1	
H	1	5.6	182.6
	2	15.9	
	3	526.4	

Table S5. Statistical significance for the average percent female carryover in the sperm fractions comparison of the SX and DE for each laboratory (alpha = 0.05). Data in Figure 5.

Mixture	Lab	Significance (Y/N)	P stat (one tail)
A	2	Y	0.009
	3	N	0.106
B	2	Y	0.033
	3	Y	0.008
C	2	N	0.058
	3	N	0.098
D	2	Y	0.002
	3	Y	0.002
E	1	Y	0.049
	2	Y	0.025
	3	N	0.203
F	1	Y	0.048
	2	Y	0.004
	3	N	0.104
G	1	N	0.059
	2	N	0.067
	3	N	0.104
H	1	Y	0.003
	2	Y	<0.001
	3	N	0.104

Table S6. Fold Differences for higher DE Female Carryover (DE/SX) in the sperm fractions and lab averages. Data in Figure 5.

Mixture	Lab	DE Fold Higher	Average
A	1	N/A	57.9*
	2	2.9	
	3	112.9*	
B	1	N/A	10.2
	2	9.8	
	3	10.6	
C	1	N/A	4.2
	2	2.7	
	3	5.7	
D	1	N/A	5.3
	2	4.1	
	3	6.6	
E	1	1.5	3.3
	2	1.9	
	3	6.5	
F	1	2.0	5.0
	2	6.3	
	3	6.8	
G	1	1.6	3.5
	2	1.8	
	3	7.0	
H	1	1.5	2.8
	2	2.1	
	3	4.9	

*A mixture not included as Lab 3 had an outlier

Table S7. Percentage of unshared male alleles detected in the sperm fractions and fold differences (SX/DE).
Data in Figure 6.

Mixture	Lab	SX-S	DE-S	Fold Difference
A	1	100.0	N/A	
	2	100.0	93.8	1.1
	3	100.0	100.0	
B	1	100.0	N/A	
	2	100.0	3.1	32.0
	3	100.0	100.0	
C	1	100.0	N/A	
	2	96.9	53.1	1.8
	3	100.0	100.0	
D	1	100.0	N/A	
	2	100.0	71.9	1.4
	3	100.0	100.0	
E	1	100.0	100.0	
	2	100.0	25.0	4.0
	3	100.0	75.0	1.3
F	1	100.0	100.0	
	2	96.9	15.6	6.2
	3	100.0	81.3	1.2
G	1	96.8	54.8	1.8
	2	43.8	3.1	14.0
	3	93.8	15.6	6.0
H	1	58.1	3.2	18.0
	2	100.0	0.0	
	3	56.3	15.6	3.6

Table S8. Percentage of the male component in the STR profile from the sperm fractions using STRmix and fold differences (SX/DE). Data in Figure 10.

Mixture	Lab	SX-S	DE-S	Fold Difference
A	1	83.0	N/A	
	2	71.8	5.1	14.0
	3	86.1	38.6	2.2
B	1	34.4	N/A	
	2	20.1	3.1	6.4
	3	55.7	19.7	2.8
C	1	35.4	N/A	
	2	7.0	3.3	2.2
	3	44.0	16.2	2.7
D	1	43.1	N/A	
	2	13.2	2.8	4.7
	3	44.9	8.2	5.5
E	1	48.4	16.9	2.9
	2	27.9	0.9	30.4
	3	48.8	4.4	11.0
F	1	44.3	11.2	4.0
	2	14.0	1.8	7.7
	3	33.9	4.2	8.1
G	1	14.6	3.6	4.0
	2	1.5	0.5	2.7
	3	9.7	0.4	23.7
H	1	3.9	1.4	2.8
	2	12.7	0.3	36.4
	3	3.9	0.7	5.7

Table S9. Likelihood ratios using STRmix and fold differences (SX/DE). Data in Figure 11.

Mixture	Lab	SX-S	DE-S	Fold Difference
A	1	3.84E+27	N/A	
	2	9.38E+26	1.37E+23	6.85E+03
	3	8.44E+26	8.48E+26	0.04
B	1	2.19E+27	N/A	
	2	4.59E+26	9.60E+02	4.78E+23*
	3	8.66E+26	3.24E+24	2.67E+02
C	1	2.58E+27	N/A	
	2	6.68E+23	7.43E+13	8.98E+09
	3	8.64E+26	2.01E+24	4.30E+02
D	1	9.70E+26	N/A	
	2	1.14E+25	1.76E+15	6.44E+09
	3	8.80E+26	1.42E+23	6.18E+03
E	1	3.33E+27	2.74E+25	1.21E+02
	2	5.16E+24	7.85E+03	6.58E+20
	3	6.27E+25	1.60E+08	3.92E+17
F	1	3.39E+27	3.43E+24	9.89E+02
	2	4.20E+21	4.82E+05	8.72E+15
	3	3.84E+26	1.02E+12	3.76E+14
G	1	5.56E+23	1.36E+07	4.08E+16
	2	5.52E+05	1.40E+01	3.95E+04
	3	8.33E+12	8.31E-01	1.00E+13
H	1	1.79E+08	4.23E+00	4.23E+07
	2	6.00E+23	1.04E+00	5.80E+23
	3	1.90E+01	2.94E+01	1.55

*One outlier for Lab 2 mixture B gave a difference of 10^{23}

Highlighted shows Lab 3 had fairly comparable results for SX and DE for mixtures A and H.