MOUSE BIOLOGY PROGRAM

Continuous process improvement in the production of animal models

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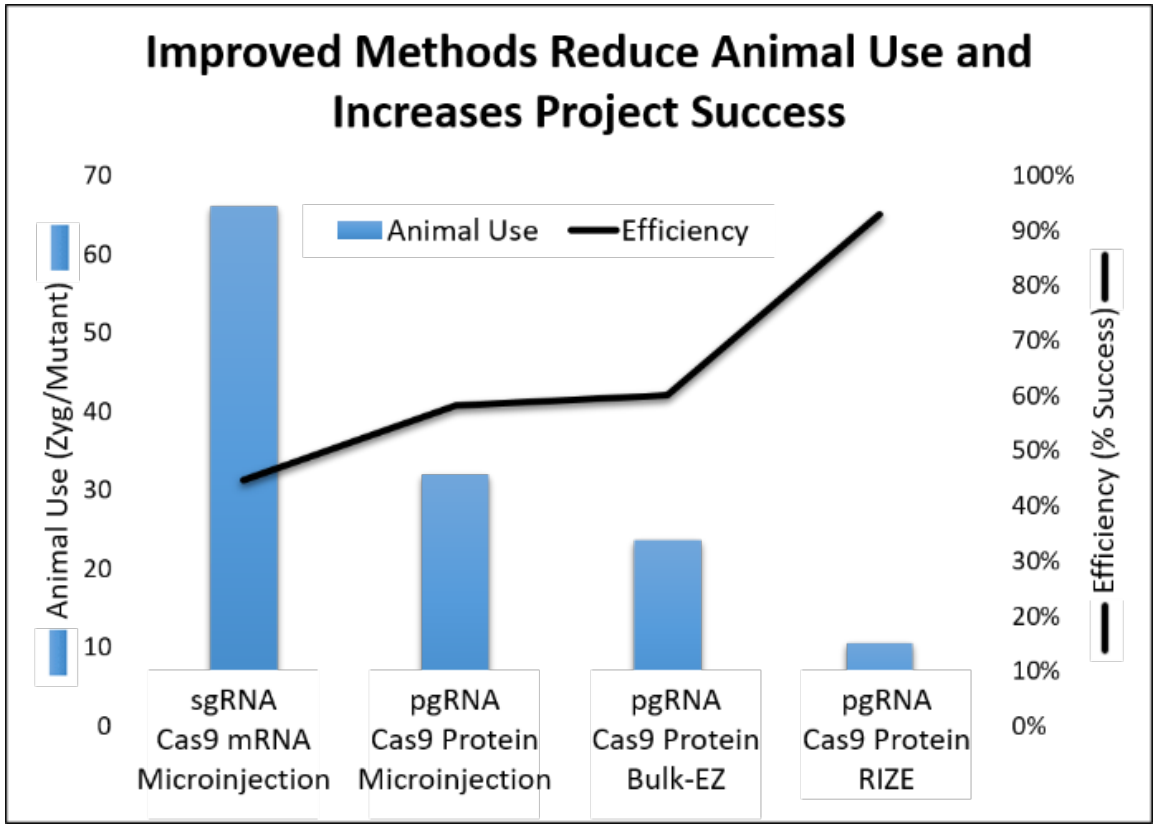
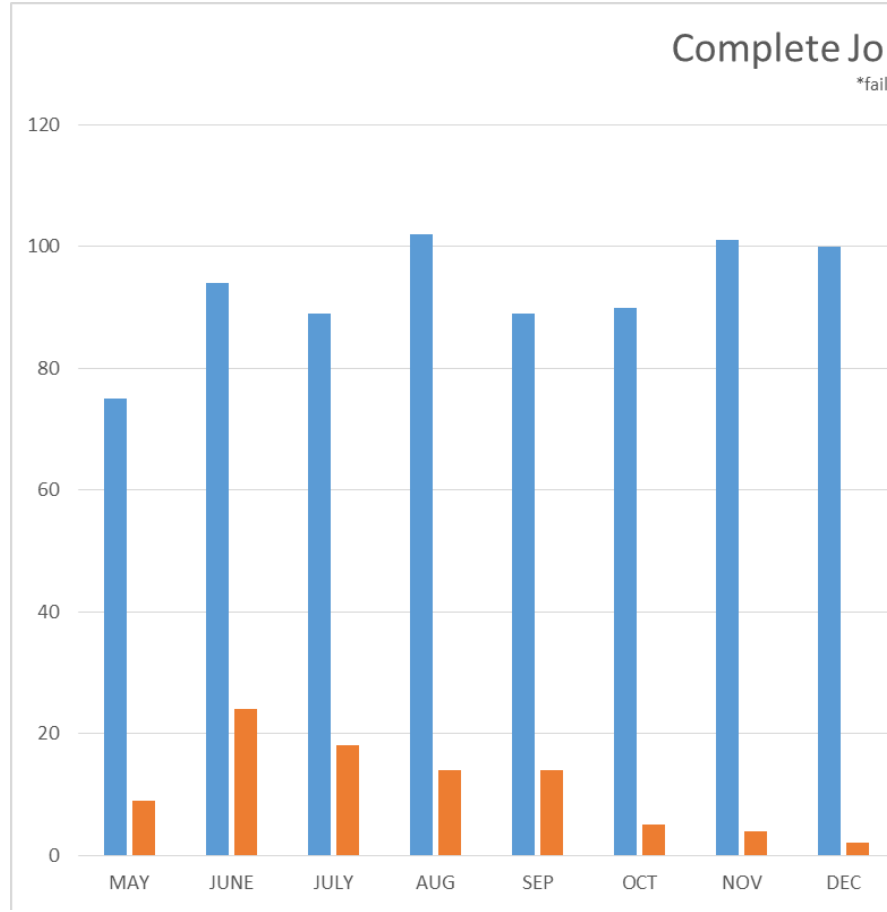
Western Association of Core Directors

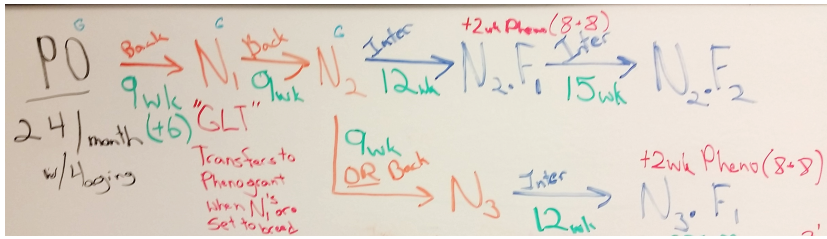
Increase Success while decreasing cost and TAT

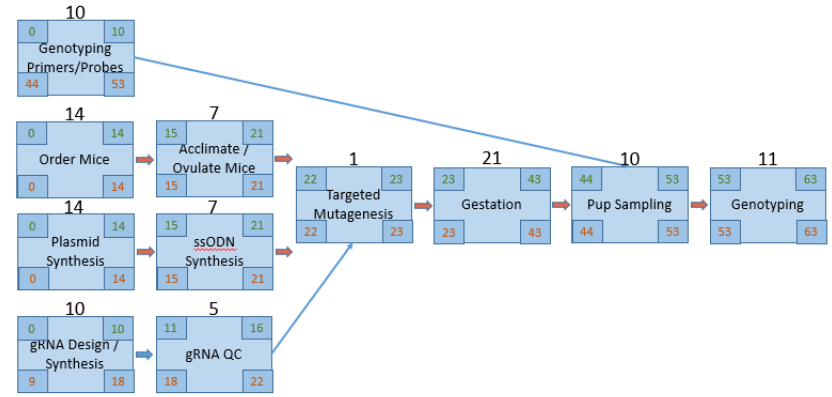


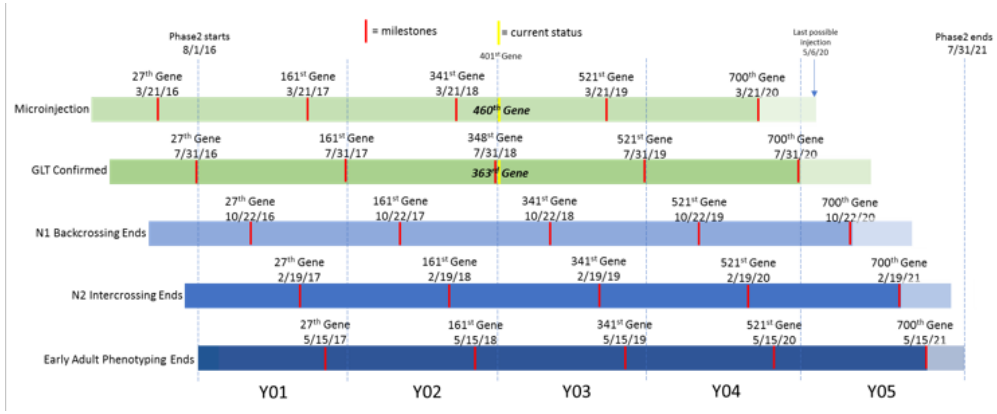


1. Quality 2. Turn around time 3. Cost

Step 1: Visualize the Process
(Problem, Title, Background)

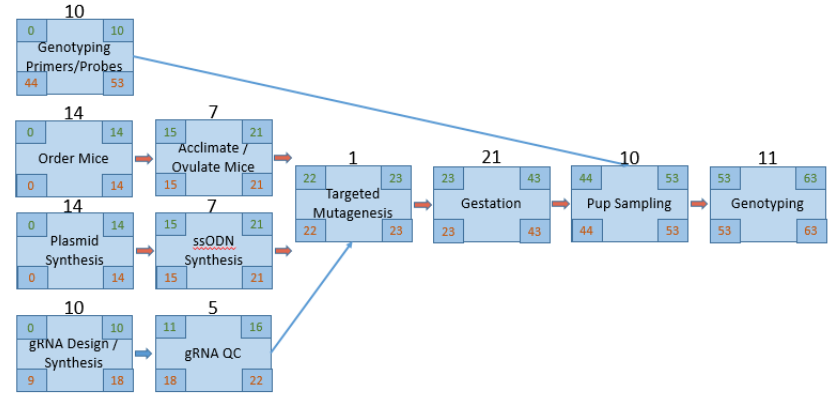


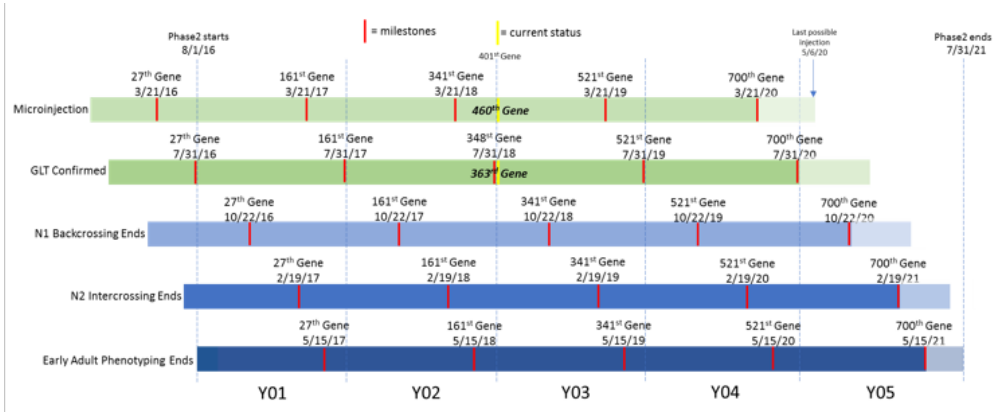


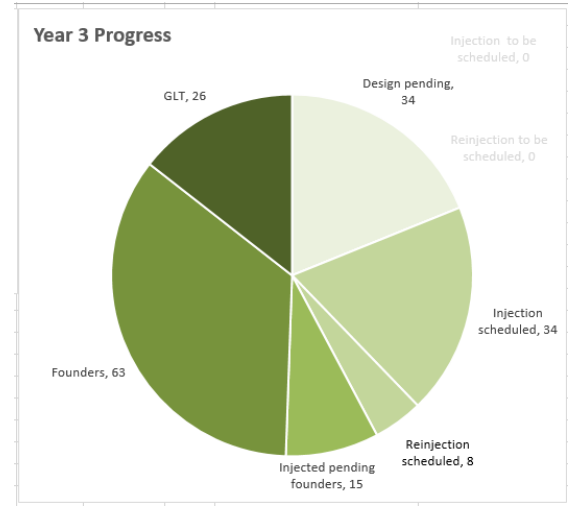


Identify the key components to measure

Step 2: Measure the process
(Current State, Metrics, Gap, and Goal)







	A	B	D	E	I	J	K	X	Z	AA	AD	AE	AF	AG
1	Gene/colony name	CR#	gRNA	INJ Date	gu id e	gu id e	inj ec tio	Pups	excel pups	Mutants/tx (Effici	HR/	Allele for Pheno	GLT date	iMITS updated
1025	Irf4_XD_LA	10293	P19	4/23/2018	mp	2G		11	4	0.3636		Dex3	8/9/2018	YES
1026	Mid1_XD_X_LA	10294	P19	4/23/2018	mp	2G		14	10	0.7143		Dex5	8/9/2018	YES
1027	Mipep_XD	10295	P19	4/24/2018	mp	2G		5	3	0.6		Dex3	8/9/2018	YES
1028	Nlrp1a_XD	10296	P19	4/24/2018	mp	2G		18	5	0.2778		Dex3		
1029	Olfr648_XD	10297	P19	4/24/2018	mp	2G		6	1	0.1667		Dex2	8/9/2018	YES
1030	Padi4_XD_LA	10298	P19	4/25/2018	mp	2G		12	4	0.3333		Dex3	8/9/2018	YES
1031	Pax6_XD	10299	P19	4/25/2018	mp	2G		11	5	0.4545		Dex8-9	8/9/2018	YES

Measuring the problem usually solves the easy fixes

20 YEARS OF SERVICE MOUSE BIOLOGY PROGRAM

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Step 3: Measure and Track the Key Outputs
(Current State, Metrics Gap, and Goal, Root Cause Hypothesis)

100 Most Recent Genes with GLT Data

↓ Electroporation

93 Genes Littered (93% success)

↓ Genotyping

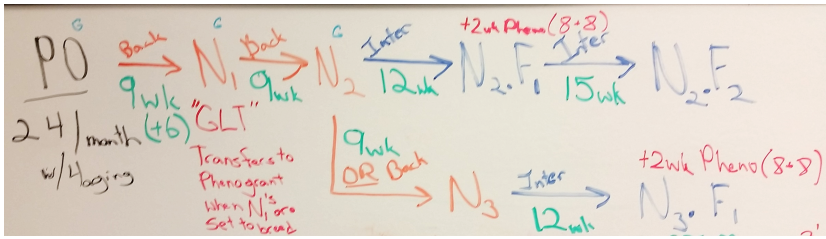
79 Genes Produced at least 1 founder (79% [85%] success)
10 of these will be repeated

↓ Breeding

72 Genes have gone GLT to date (72% [91%] success)

↓ Slower Breeders

5-6 Genes still breeding and within the last 5 weeks of reporting
(77-78% + 6-7 from the repeats = 83-85% total per gene success)



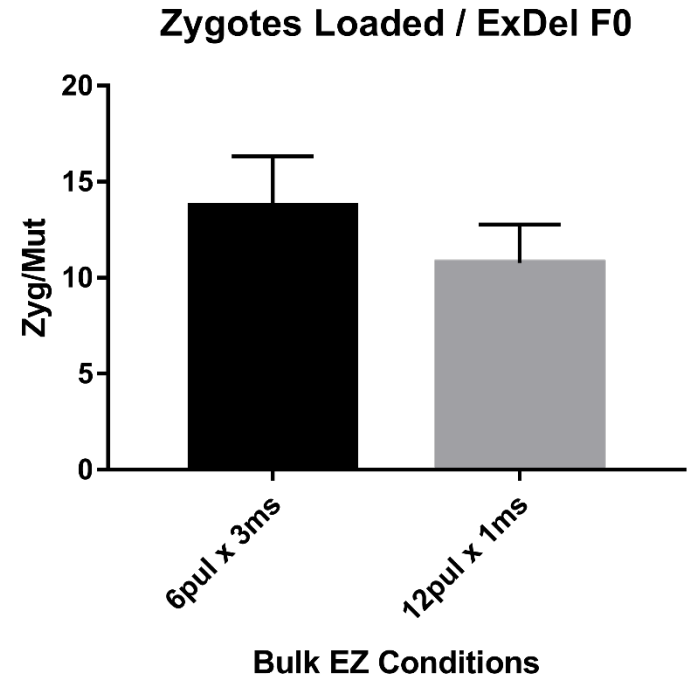
Use real data to understand hypothetical vs reality

- Frequently the problem exists where the two deviate
- Having the data is the key to root cause analysis

Step 4: Implement Controlled Pilots Experiments to Improve Process (Counter Measures, Root Cause Testing, Continued Monitoring)

	2 x (6 x 1ms x 100ms)	6 x 3ms x 100ms
N (Total)	17	17
Zyg Load (Tot)	442	425
Zyg Trans	340	340
N (Littered)	14	14
N (Litt w/ExDel)	13	12
Pups	132	110
ExDel	41	32

	2 x (6 x 1ms x 100ms)	6 x 3ms x 100ms	
Litter Rate	14/17 = **82%**	14/17 = **82%**	P value
%ExDel Pups	41/132 = **31%**	31 / 100 = **29%**	
ExDel / Zyg Load	41/442 = **10.8**	32/425 = **13.3**	0.18
ExDel / Zyg Trans	41/340 = **8.3**	32/340 = **10.6**	0.17
First Pass Succ	13/17 = **93%**	12/17 = **86%**	



Don't pivot your process on a dime!