18

1357

(17)

DATE: 1109-C3. REF:

1	2	3	4	5	6	7	8	9	10

see note

6/21. Not yet analyzed.
Lac V, Ara:

Plated on B Ara: pure Ara$^+$. 4 checked: Lac$^+$ V_1^r.

But weak Lac reaction is suspicious. Plate on B Gal.

Restreaked 18 on B Lac: pure Lac$^+$ but weak and strong weak Lac$^+$ are Gal$^-$! (2-3 ? Lac$^-$ small cols.)

~~History 10 → motile clumps → (11) ⊕ → C3~~

∴ if ♂ is present, not reliable. However, presence of Gal$^-$ recombinant may be valid. So far, 18 seems to carry Ara$^+$ Lac$^+$ Gal$^+$/$-$ V_1^r

contemporary record: MXAy$^-$ S^R (Gal^{+}).

Note: so far identified: Gal$^-$ Lac$^+$ Ara$^+$ V_1^r.

Isolates:

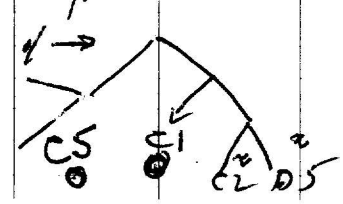
a. Gal$^-$ Lac$^+$ Ara$^+$ V_1^r | Xyl$^+$ S^s | Gal$^-$ S^s V_1^r Lac$^\pm$ Ara$^+$
b. Gal$^+$ Lac$^+$ | Xyl$^+$ S^s | Gal$^+$ S^s V_1^r Lac$^+$ Ara$^+$
c. Lac$^+$? | Xyl$^+$ S^s | Gal$^-$ S^s V_1^r Lac$^\pm$ Ara$^+$
o | Xyl$^+$ S^s | Gal$^+$, $^-$ S^s (− more^s than +) V_1^r Lac^{++} Ara^{++} V_1^r

18 is not yet tested on Mal. Is it the ♂?

7/2 On later review, I find that I have used [145]-C3 for these tests. This is the copartner of C1 = #17, both stated and accepted as 100 0800 types

17A = C2
17B = D5
17C = C1

C3/C5



June 24 1957. Incomplete numbers. 1357 B.

DATE: REF:

	1	Found	3	4	Wanted	6	7	8	9	10
✓ 6	55H5.	111 011			000 ~~1000~~					
✓ 9	56C1	101			100 ~~001~~	mostly Lac⁻		000 ✓ ~~000+~~		
10	C3	101 001 000		✓	~~100 001~~ Verify	~~Lac† → Lac††.~~		No 100		
11	D1	100 001 000			Verify					
~~12~~	~~B3~~									
13	G5	111 000 011			100					
18		111 ? ...		GAL!	Verify	Plated: pure Ara⁺.				
✓ 19	60A2	010 000			1.. (Original record)	Lac⁺ died out.				
✓ 21	61G1	0... 111 0001 111 1111			000 1111 0000001	{(~~000 00~~ 111 0000 is absent)} 1110				
✓ 23	63C2	Hfr total ~~Ara~~			Review					
✓ ~~24~~ 25	G5	101			(110 001) — not present.					
✓ 26	B6	011 000			~~010 001~~	Ara⁺ 1-				
✓ 27	64B3	101 000			(100 001) — none found.					
29	64D3	000/111 · 0000/1111			~~Lgt + S⁺ ? check~~					
30	65A3	000 100 1.1.1 (1.0)		Lac⁺S^s	Ara⁺ types... 011			300B.		
✓ 35		111 000			[illegible] Lac⁻ S⁺ ? Instead S^s.					
✓ 36		111 011			000 100	: No Ara⁻. Segr. at n_2-3.				
✓ 55		Lac/Mal.								
56		101			Verify; V_1? 001 × Schulz Arp ~~100~~ of 13. V_1^s ~~Hetero pure Lac⁺: 001~~:					
~~65~~		011 110			" ; ~~111~~ ~~[illegible]~~					
66		011 100			" ; ~~[illegible]~~ ~~[illegible]~~					
67		100; ~~Hfr 20~~			Verify ~~Hfr~~ → (B1, B2, B3 in smooth)					
68		001 110	100 000		"					
~~67~~ 71		111 000			" 100...					
72		111 110			" 001...					
74		~~10~~ 101			" ~~Retest~~					
81		011 100			~~Retest~~ Verify					
84		101 only			Verify; ~~[illegible]~~ no V_1^s, no Lac⁻ evident					
88		Fla			Review.					

DATE: REF:

1	2	3	4	5	6	7	8	9	10

17 100 022

18 ~~[illegible]~~ 100 ?001 100

~~23~~ → 17 ~~111...Gal~~ S^s ~~pure Ara~~ ~~111 0000 0~~ ~~111 0000 1~~ dls?

23 (Hfr-Gal)

35 111 000 LacS^r ✓ 000 0000 111 0000 111 0001

88 Fla, MXM, Gal? Rx two molecules.

65 0~~[illegible]~~ 111 000 verify....

66 ~~011 100~~ 111 000 "

67 A (100;) ~~[illegible]~~ 000 ✓

68A ~~001 110 100 000~~ 101 010 000 "

71 A 111 000 011

72 B 111 ~~110~~ 000

74 101 100 000 no 001 seen.

81 011n100

87 101 Loc^+ very weak, while Gal : also weak.

~~[illegible] 12, 13, 30, [illegible].~~

DATE: 1155 - 2. REF:

1	2	3	4	5	6	7	8	9	10

d, Now almost pure $Ara^+ Lac^+ V_1^r$ All V_1^r is Lac^+ ~~Ara~~ Ara^+. ~~~~ ooo 111.
Further analysis not promising.

~~[illegible]~~ = No sib

(6) 1B87 – 6

DATE: 11 JAN 45 (= A9) REF:

1	2	3	4	5	6	7	8	9	10

α: Lac V, Ara. 111 and 011. ~~No 000 nor any.~~ rare 000

? looks for 100, 000. Are there any subs? Yes ~~[illegible]~~ C4 = A8 could not be found. **Found?**

↓ Replicate on B Ara.

6/25. ~ 1% Ara⁻ / ~600 Ara⁺. Spots on B Lac 6 are $A^- L^- V_1^S$ = 000

3 contain $L^- V_1^R$, probably {000 / 011} but which on Ara. The plate was crowded and many Ara⁻ picks were certainly mixed. Spot V_1° and V_1^R components on Ara.

∴ V_1^R is Ara⁻. V_1 is Ara⁺/⁻.

∴ .00 & .11 as indicated. As these are all Lac⁻, no 100 indicated

111
011
000
No 100

MXAY.

7

1357
7

DATE: REF:

1156 B 2'.	2	3	4	5	6	7	8	9	10

Lac AraC, Xyl MHL Mal S Gal

Previously found 000... and 111 1000 0 <u>only</u>

5/57 α and current tests consistent
(17 Lac⁻ are 000..)

1304
8
9 ✓

DATE: REF:

1156 YBS.	2	3	4	5	6	7	8	9	10

Previously identified 4 types :

	Lac Ara V_1	Xyl MH Mal S	Gal
1	0 0 0	0 0 0 0	0
2	1 0 0	0 0 0 0	0
3	1 0 0	1 0 1 0	0
4	0 0 0	1 0 1 0	0
5	0 1 0	0 0 0 0	0

However, record showed Ara⁺ also present. V_1^s. This now verified and isolated as #5.

6/20. Mostly $Lac^+ Ara^-$. Very few Xyl^+ (this also Mal^+).
Altogether 73 Ara^+ tested : all $Lac^- Mal^- Xyl^-$. As whole culture is V_1^s, S^r this defines type 5. Stab example!

9. Lac^- pool: all V_1^s . . . 101 ✓000 no 001 / no 100

not tested: $Lac^+ V_1^s$.

as cross brush, 9 has mostly $Lac^- V_1^s$; rare $Lac^+ V_1$?, ~~[illegible]~~ ~~[illegible]~~ no appreciable diminution in T1 portion. Record as no 100.

(10)

1387
10

1156 & 3

DATE: REF:

	1	2	3	4	5	6	7	8	9	10
	Lac VI.									
	Poststalement		101	001	000	muds to be verified ✓				
						any 100?		No		
	Replicate 200 cols (+,-) to Lac T1, [redacted]									
10	1.1	0.0	0.1	evident	No	1.0				
>100 colonies										
20										
30										
40										
50										

(11)

1357
11

DATE: 11/26/01 REF:

1	2	3	4	5	6	7	8	9	10

Lac V1

100 001 000.

Verify. Dec 10

plate: all lac⁻ → pool, contains 000 001

10 Original cross brush, recollects mainly −R, +S. one presumably no +S.

∴ present 000
001
100

absent 101.

✓ but repeat cross-brush. : mostly 001 but unincubated

20

30

40

50

13

1307
13 ✓

DATE: ~~Feb~~ 65

REF:

1	2	3	4	5	6	7	8	9	10

111 000 011 identified. about = ~~prop~~ Lac+, – Ara+ – others.

looks for 100. [illegible] tested already: 27 Ara⁻ are Lac⁻ V₁ˢ.

An apparent 001 proved to be Gal± Glu± = 13A. probably a mutant. of 06

α 1:0 Lac + – V₁ʳ +S   Plate: Mostly Lac+. looks for Lac+ Ara⁻

Ara + r –S

see: Lac⁻ Ara+ –
Lac⁻ Ara⁻
>100 tests. Lac+ Ara+

No
1? Lac+ Ara⁻. Actually
✓ Lac+. Verify Ara.
Ara+ V₁ʳ

DATE: 1159-03 REF: 100 ✓ 100

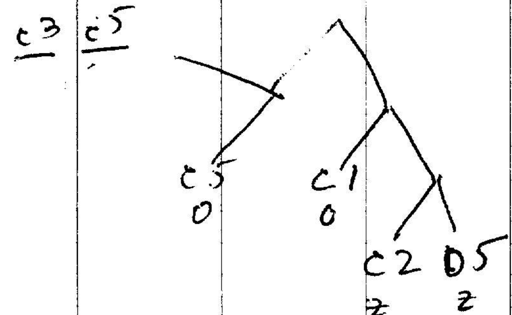
/146/ = A [2] /145/ = a [3] 4 5 6 7 8 9 10

This was quite a scramble, as #18 q.v. was taken as 1159-c3 by mistake, (failure to distinguish the two series) and found to be 111 .1.1 1 and 0.

This culture (17-C3) was found to be pure Lac+, Ara+, V_i^r, motile, but mixed on Gal.

7/2/57 Does the Gal mixture have any significamce or is it a reversion? The contemporary record implies it was pure Gal- at that time. However, the whole pedigree should be re-screened.

call this 17C4



acc. 1184: C2 and D5 are 100/000 only.

	Lac	V_1	Ara		Gal
17 C1	−	S	−		+
C2	+	S	−		+ ++
C4	±	R	+	= Gal⁻ Lac⁺ sensdoubt	−
C5	−	S	−		+
D5	−	S	−		+

all unmixed.

of C3 + R + Gal⁺ and ⁻.

Change from contemporary record, presumably Gal⁻ → Gal⁺ mutation but check Hfr.

x Y10m MLac C3 and 3 s.c.i are all Hfr.

DATE: 1159-03 [1146] C3 REF: 100 000.

1	2	3	4	5	6	7	8	9	10

See 17 in re initial mixup.

History: a /oo complex grew into a clump from which // were discarded and ooooo were pooled to give C3.

1184-19 states that this culture also has 111, to be verified. (It is quite possible that the same error was made then). Ached!

fact, − V_1^S Ara$^-$

18;

need check for 100, 001

DATE: 11 60A2. REF: ✓

Previously recorded as Lac$^+$, Ara$^+$ (V_1^s) Also Lac$^+$/Lac$^-$ V_1^s for DCG 10/04

& Now pure Lac$^-$! Ara$^{+,-}$ V_1^s.

000
010

{1.0
{.10

111

Try sbs as Lac, Ara; Reisolate 19. for Lac$^+$

6/24. (= 2A-F) 2C - n.g.

~~A B Lac V_1^s~~, S

143

Do not confuse 144

	Lac	V_1	Ara	V_1
A	–	S	+	S
B	±	R	+	R
D	–	S	–	S
E	–	S	–	S
F	–	S	–	S

♂

Is B the ⊕ rather than A? No This is ♂

As Lac$^+$ component vanished, ~~[illegible]~~ we record only the 010 element, and consider the Lac$^+$ line as expired by accident.

21

1307
21
✓

DATE: 1.6.1 G 1.   REF:

1	2	Found:	4	5 Absent	7	8	9	10

Record:

Found:			Absent		
000	0000	0	1..	...0	
111	0001	·	...	1..0	
111	1111	·	...	..10	
			0..	..1.	
			.1.	...0	now.

5/57: Recip: now mostly Ara' V₁' Lac'
α: also some Lac° Ara° S^r

While no S° recombinants are evident, further search is warranted for 000...1 types.
To facilitate this, enrich the Mal⁺ components of present culture.

Forcheck, found: 61G1-0 Ara⁺ V₁^r = whole.

A	–	s
C	+	r
D	+	r

whole culture is Gal⁺. Replicate to Y10. for possible ~~xxx~~ mt⁺ components (10⁷)

→ brush on B Mal, incubate 1 day then restreak. Spot Mal⁺ to B Lac. Mal ex is weak, should perhaps have used Xyl instead. ~ 8 Mal⁺ all Lac⁻   also Lac⁻ Mal⁻

1307
22

DATE: 1162H5 REF:

	1	2	3	4	5	6	7	8	9	10
α:	Lac,	Ara		V_1^S					110	
									no 000 now	
10										
20										
30										
40										
50										

DATE: 7/4/07 REF:

1	2	3	4	5	6	7	8	9	10

000
100
101
001

Replica: All Arat
Mostly 000.
Many ~~100~~ 100, 101
No 001 seen here. (-rebunch)
↘ Restricts V, R on rotor.

any sites? for 001.

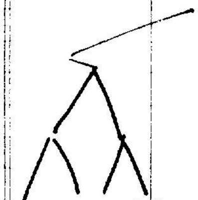
Restrict from V, R → Lac 2 clo/> 100. Rebuild. ✓ Yes 001

1357
80 ✓

DATE: 1207-A4.   REF:

1	206 2	3	4	5	6	7	8	9	10

Recorded as Ara, Lac, Lac.



α: A Lac⁻ Ara+S −R ✓ No Ara$^+V_1^r$ 010 001
B Lac+/− Ara− S. ✓ 000 100
C Lac+S/−R Ara− ~~000~~ 001 100

000
001
010
100

Ara$^+V_1^r$ check A: 000 ✓, ~~000~~, 001 ✓, 010 ✓, 011, 100 ✓
Lac$^+V_1^r$ check C. ← 101
110 ×
111 ×

Note this example of early Ara segregation of others.

of 68.

? 011 = Ara$^+V_1^r$ Lac⁻ Could this be present in A? No, Ara$^+V_1^r$ present
101 = Lac$^+V_1^r$ could this be in C?
Should be repeated. No Lac$^+V_1^r$. ✓

The Fla+ pedigree 1351-88

DATE: REF:

	1	2	3	4	5	6	7	8	9	10
	Ara V_1		Lac V_1		Xyl ...					
α:	A −S +R B −S C −S	A	(+, −) −S −S	R, S.	+S −R +S −R −R		? +R (Fla+)	Mixed Gal+/Gal−.		

∴ 88A seems to include ♂. Basis in pedigree?

It was so listed at the time (12/10). However, ~~of~~ artefact could not be ruled out. It was isolated as pure ♂. future cell might have been abortive motile ♀

88B: original recorded as MxM+. Has a small Xyl+ S^s component. Replate from this inoculum. (faint rx)

Very faint Sw. Almost unscoreable.

88A 1 Gal+ S^s V_1^r
2 Gal− S^s V_1^r

B Gal+ S^R V_1^s

DATE: REF:

Multiclass: ... only .

1	2	3	4	5	6	7	8	9	10
111-011	111·100	010·101 100·001	010·000 001·100	100 101 001 000	101– 001		100 - 001	~~100 101 001~~	
6 13 36 53 65 71 81	30	68	80	74	10		11	~~74~~	
7	1	1	1	1	1		1	~~1~~	

Multiclass. — nil ....

7 111 1000 only

8 $\frac{100}{000} \cdot \frac{1010}{0000}$ plus 010

21. 111 · 0001 and 111·1111

29 $\frac{000}{111} \cdot \frac{0000}{1111}$

31 $\frac{100}{000} \cdot \frac{0000}{0011}$

35 111 · 0001 111·0000

55 $\frac{100}{000} \cdot 0010$

58 $\frac{100}{000} \cdot \frac{1000}{0011}$

only 29 is segregating M.H. Is it one available? Omit from analysis

7/4/57. Semi final analysis 13507

DATE: REF:

(1) Sing. Recombinant clones.

100	010	001	110	101	011	111
1 52	19	not esc.	22	5	26	3
2 87	60			8		34
4 59				[illegible]		51
7 61				25		54
12 62				27		66
14 63				56		72
15 64						
16 67						
17 69						
20 70						
24 73						
28 75						
32 76						
33 77						
37 78						
79 84						
82 85						
83 86						
[illegible]						
18						
~~36~~ 37	2	—	1	~~4~~ 5	1	6
add 5	2	4	0	3	7	8
41	4	4	1	9	8	14
add 4	1	1				4
~~45~~ 46	5	~~4~~ 5	1	~~9~~ 8	8	18

(1 F/a
1 tal)

Lac = 45+1+9+18 = 73

Ara = 5+1+8+18 = 32

V_1 = 4+9+8+18 = ~~39~~ 40

should be Lac V_1, Ara.

~~Semi~~final 7/4/57

Preliminary resume 1357

51–88

Final 7/7/57

DATE: REF:

#	Exp	code	coz.	sibs	prelim scores	6	7	8	9	Finish
51	1185	C1				111 000		111		>
52		G2				100 000		100		>
53	1186	A1	A2 B12			011 000; 100 No 111		100 011		>
54		C4	C11 C12			000; 111 000		111		>
55		F4	F6 F5		Lac' Mal'	00;10;01 No 11		100 0010; 000 0010		
56		D1	D11			101		101		
57		G1	G12			100		100		>
58		H4	extensive pedigree			.00....		Tetrad *		>
59	1197	D3	D3	C3 H5		100 000		100		>
60°		B4				010		010		>
61		H4	H4	D4		100		100		>
62	1200		D6			100		100		>
63			A3			100		100		>
64	1203–197		a5–a6..			100		100		>
65	1204	D1	D3		~~011 100~~			111 011		
66	1205	B4			~~011 100~~			111		
67	1205	G4			100 ; male?			100		
68	1206	204–5	2;3		001 110; 100 000			010 101 001 100		
69			5			100		100		>
70°			26			100		100		>
71			14 16		111 000			111 011		
72			34 36		111 110?			111		
73			41			100		100		>
74			43		100			100 101 001		>
75–1207		206–	A1			100		100		>
			B5			100		100		>
			~~B~~D1			100		100		>
			F1			100		100		>
79			G4			100		100		>
80°		A4	A2–5–6		010 001; 000 100; 001 100			001 010 100		
81		207	C1 C3	D2				100 011		
82		B4	A2		100			100		>
83		A4	A6		100			100		>
84		D5	D5		100			100		>
85		G4	D6		(100) now 000			100		>
86	1210	208	D1 d1 d5		100; 100			100		>
87		C1	~~D~~ PA g2		101...			101		
88					Flat see pedigree			Flat		

40

50

* 100/000 · 1000/0011

DATE: Rewrite Lac V, Arg: REF:

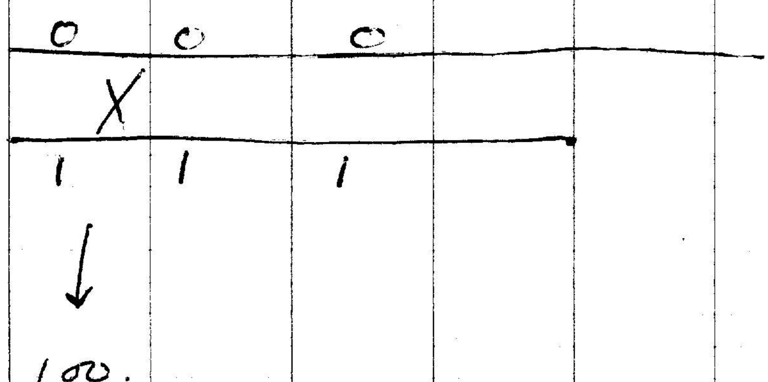
100	45		100
111	18		111
101	9		110
011	8		011
010	5		001
001	4		010
110	1		101

100·111 1
·111 1 each.

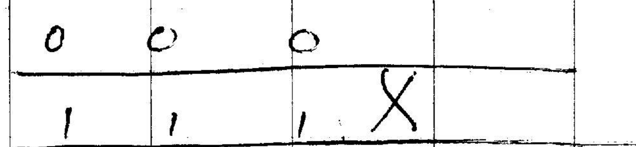
The only efficient mutant is then $\frac{111}{011}$

In fact $\frac{7}{18}$ carrying 111 also carry 011 but 011 is very rare alone. Suggests heterozygosity or interaction

(a) The 100



(b) the 111 yields pair in all regions to give more recombinants.



why ·011 > 111·100? Excess of double crossovers. right of 111?

Final accountings of singe pair progenies

(1153-1210)

DATE: July 7, 1957

Lac Ara Vl (Mtl Xyl) Mal S Gal Fla

REF:

Initial ascertainment included all markers except Vl.

a) Only Lac Ara or Vl segregating . 000 present in (virtually) every progeny

100	111	111/ 011	101	010	one each:
1 61	3	6	5	19	001 not ascertained
2 62	34	13	8	60	
4 63	51	36	25		100 22
7 64	54	53	27		
12 67	66	65	56		011 26
14 69	72	71			
15 70		81			111/100 30
16 73					
17 75					101/001 10
18 76					
20 77					100/001 11
24 78					
28 79					010/101/100/001 68
32 82					
33 83					010/ /100/001 80
37 84					
52 85					101/100/001 74
57 86					
59					
[37]	[6]	[7]	[5]	[2]	[8] =

(65)

b) Also other markers [10]

7:	111 1000 only ✓	1
8:	100/000:1010/0000 [also 010]	5
21:	111 0001 & 111.1111 ✓	2
29:	000/111:0000/1111	6
31	100/000:0000/0011	7
35	111 0001 111 0000	3
55	100/000:0010	4
58	100/000:1000/0011	8
23	000 0000 1 0	
88	000 0000 0 1	

Total: [75] progenies. How many total pairs?

(1153-1210)

Lac Ara Vl Mtl Xyl Mal S Gal Fla

DATE: July 7, 1957 REF:

Initial ascertainment included all markers except Vl.

a) Only Lac Ara or Vl segregating . 000 present in (virtually) every progeny

100	111	111/ 011	101	010	one each:
1 61	3	6	5	19	001 not ascertained
2 62	34	13	8	60	
4 63	51	36	25		110 22
7 64	54	53	27		
12 67	66	65	56		011 26
14 69	72	71			
15 70		81			111/100 30
16 73					
17 75					101/001 10
18 76					
20 77					100/001 11
24 78					
28 79					010/101/100/001 68
32 82					
33 83					010/ /100/001 80
37 84					
52 85					101/100/001 74
57 86					
59					
[37]	[6]	[7]	[5]	[2]	[8]

b) Also other markers [10]

7: 111 1000 only

8: 100/000:1010/0000 also 010

21: 111 0001 & 111.1111

29: 000/111:0000/1111

31 100/000:0000/0011

35 111 0001 111 0000

55 100/000:0010

58 100/000:1000/0011

23 000 0000 1 0

88 000 0000 0 1

Total: [75] progenies. How many total pairs?

1357
sum.

DATE: July 7, 1957. REF:

Sums: (by progeny, not number of recombinants).

Lac: 37+6+7+5+7+8 = 70 = 75 -(19,60,26,23,88).	70	93		
Vl : 6+7+5+7+4 =	29	39		
Ara : 6+7+2+5+5 =	25	33		
Mal:	6	8		
Xyl, S	5,5	7		
Mtl	2	3		
Gal, Fla	1,1	1		

Perhaps a better sequence tha Lac Ara Vl Xyl Mtl Mal S would be one to fit the above, Lac Vl Ara Mal S Xyl Mtl. Where this is done, substitute i/l

This will make the descending order of individual types as follows:

Better S Mal Xyl. MH.

100	i00	~~14~~ 12	1000	00i0	00~~1~~0	0010
111	iii	18	1010	i0i0	01~~1~~0	0110
			0001	0i00	00~~1~~0	1000
011	0ii	8	0011	ii00		1100
			0010	i000		0100
101	ii0	8	0011	ii00		1100
010	00i	8	No particular advantage here.			
001	0i0	5	1111			1111

DATE: REF:

Sums: (by progeny, not number of recombinants). %

Lac: 37+6+7+5+7+8 = 70 = 75 -(19,60,26,23,88). 70 93

Vl : 6+7+5+7+4 = 29 39

Ara : 6+7+2+5+5 = 25 33

Mal: 6 8

Xyl, S 5,5 7

Mtl 2 3

Gal, Fla 1,1 1

Perhaps a better sequence tha Lac Ara Vl Xyl Mtl Mal S would be one to fit the above, Lac Vl Ara Mal S Xyl Mtl. Where this is done, substitute i/l

This will make the descending order of individual types as follows:

100	100	41	1000	0010
			1010	1010
111	111	18	0001	0100
			0011	1100
011	011	8	0010	1000
			0011	1100
101	110	8		
010	001	8		
001	010	5		

No particular advantage here.

Resume of zygotes: renumbered

DATE: REF:

#	Exp/Slide	zygotes 2	3	Markers segregating	Lac(Ara) Vl Analysis	Mal...	9	Pedigr
1	53D2			Lac	-s			
2	D4			Lac	-s			
3	59A3	130-D3		Lac Vl [+r] Ara	+			
4	F2			Lac	-s			
5	F5			Lac Vl [+r]				
6	H5	H5		Lac Vl Ara				
7	56B2	131-		Lac Vl Ara Xyl				
8	B5			Lac (Ara) Xyl Mal				
9	C1			Lac Vl				
10	C3			Lac Vl	+r -r -s			
11	D1	[illegible]		Lac Vl	-r +-s			
12	F3			Lac				
13	G5	G5		Lac Vl Ara				
14	58B1			Lac				
15	H2			Lac				
16	59A3			Lac				
17	59C2, D5			Lac				
18	C3			Lac Vl Ara	+r, -r			clump
19	60A2	A2		Lac Ara				
20	61C4			Lac				
21	61G1			Lac Ara Vl Mal Xyl	See detail.			
22	62H5	137 H5		Lac Ara				
23	63C2			Gal Hfr	x			
24	D6			Lac				
25	G5			Lac Vl				
26	63B6	B6		ara			vl.	
27	64B3			Lac Vl				
28	64C6			Lac				
29	64D3			Lac Ara Mal Mtl S	X			
30	65A3, A6, B5 B6			Lac Ara Vl	+-s/++r			x
31	65D2			Lac Mal S	++/+-			
32	65E3			Lac				
33	H3			Lac				
34	66C1	153- C1		Lac Ara Vl				
35	66C3-4	C3 C4		Lac Ara Vl	+ r/- r			
36	83A2	173-A2 [3-6]		Lac Ara Vl				
37	83B6			Lac				

These have all been scored for V_1^r and for Lac+V_1^r (presumably there are no cases of Lac+Vl^s/Lac-Vl^r except 56D1. Lac means that the only detected recombinants were Lac+Ara-Vls. LacVl means that Lac+Vl^r was detected; it does not rule out the additional presence of Lac+Vls or Lac-Vlr, though these are sometimes indicated. Detailed analysis is made only for Lac.Ara cases. For Mal... cases, see detail sheet. There have been no Lac+ S^s/Lac-S^r lacking +r.

~~Scan~~ finif 7/4/57 1357

Resume of zygotes: renumbered

Final 7/7/57

composition
ooo understood

DATE: REF:

#	Exp/Slide	2 zygotes	3	4 Markers segregating 5	6 Lac(Ara) Vl Analysis	[redacted]	9	10 Pedigr
1	53D2			Lac	-s	100		
2	D4			Lac	-s	100		
3	55A3	130-D3		Lac Vl [+r] Ara	+	111		
4	F2			Lac	-s	100		
5	F5			Lac Vl [+r]		101		
6	H5		H5	Lac Vl Ara		111 011		
7	56B2	131-		Lac Vl Ara Xyl			111 10000	
8	B5			Lac (Ara Xyl ~~Mtl~~ Mal		100/000 · 1010/0000 ; 010		
9	C1			Lac Vl		101		
10	C3			Lac Vl	+r -r -s	101 001		
11	D1		~~[illegible]~~	Lac Vl	~~[illegible]~~ -r +-s	100 001		
12	F3			Lac		100		
13	G5		G5	Lac Vl Ara		111 011		
14	58B1			Lac		100		
15	H2			Lac		100		
16	59A3			Lac		100		
17	59C2, D5			Lac		100		
18	c G3			Lac Vl ~~[illegible]~~	+r, -r	100		clump
19	60A2		A2	Lac Ara V_1^s Not rec+ now		010		
20	61C4			Lac		100		
21	61G1			Lac Ara Vl Mal Xyl	See detail.	111 · 0001/1111		
22	62H5	137 H5		Lac Ara V_1^s		110		
23	63C2			Gal Hfr	x	000 00001		
24	D6			Lac		100		
25	G5			Lac Vl		101		
26	63H6		B6	Ara $Lac^- V_1^r$		011 wk.		
27	64B3			Lac Vl ~~[illegible]~~		101		
28	64C6			Lac		100		
29	64D3			Lac Ara Mal Mtl S	X	000/111 · 0000/1111		
30	65A3, A6, B5 B6			Lac Ara Vl	+-s/++r	111 100		x
31	65D2			Lac Mal S	++/+-	100/000 · 0000/0011		
32	65E3			Lac		100		
33	H3			Lac		100		
34	66C1	153- C1		Lac Ara Vl		111		
35	66C3-4		C3 C4	Lac Ara Vl	+ r/- r	111 S^R/S^S		
36	83A2	173-A2 [3-6]		Lac Ara Vl		111 011		
37	83E6			Lac		100		

These have all been ~~[illegible]~~ scored for V_1^r and for Lac+V_1^r (presumably there are no cases of Lac+Vl^s/Lac-Vl^r except 56D1. Lac means that the only detected recombinants were Lac+Ara-Vls. LacVl means that Lac+Vl^r was detected; it does not rule out the additional presence of Lac+Vls or Lac-Vlr, though these are sometimes indicated. Detailed analysis is made only for Lac.Ara cases. For Mal... cases, see detail sheet. There have been no Lac+ S^s/Lac-S^r lacking +r.

Resume of zygotes: renumbered

DATE: REF:

#	Exp/Slide	zygotes	Markers segregating	Lac(Ara) Vl Analysis	8	9	Pedigr
1	53D2		Lac	-s	1000 000	✓	
2	D4		Lac	-s	100 000	✓	
3	55A3	130-D3 = A2	Lac Vl ✓ [+r] Ara ✓ S ok.	+	111 000	✓	
4	F2	A7	Lac	-s	100 000	✓	
5	F5	A4	Lac Vl [+r]		101 000	✓	
6	H5	H5 A9	Lac Vl ✓ Ara ✓		111 011	No 000!	
7	56B2	131-	Lac Vl Ara Xyl Mal- Mtl-	✓ sole type!		✓	
8	B5		Lac ✓ (Ara) Xyl Mtl Mal	✓ [Lac+/-][Mtl+ Xyl+/--]		V_1^s ✓	
9	C1		Lac Vl		101		
10	C3		Lac Vl	+r -r -s	101 001 000		
11	D1	~~[illegible]~~	Lac Vl	~~[illegible]~~ -r +-s	100 001 000	✓	
12	F3		Lac ✓		100		
13	G5	G5	Lac Vl Ara		111 000 011	~~[illegible]~~	
14	58B1		Lac		100	✓	
15	H2		Lac		100	✓	
16	59A3		Lac		100	✓	
17	59C2, D5		Lac		100	✓	
18	C3		Lac Vl Ara	+r, -r		✓	clump
19	60A2	A2	[~~Lac~~ Ara V_1^s Lac+ didn't.	000 (4 types)	010	✓	
20	61C4		Lac			100 ✓	
21	61G1		Lac Ara Vl Mal Xyl S	See detail. (Mtl+)			000
22	62H5	137 H5	Lac Ara ✓ V_1^s		110	No 000 now ✓	
23	63C2		Gal Hfr	x			
24	D6		Lac		100	✓	
25	G5		Lac ~~[illegible]~~ Vl		101		
26	63B6	B6	✓ Ara V_1	011	000	vl. ✓	
27	64B3		Lac Vl		101		
28	64C6		Lac			✓	
29	64D3		Lac Ara Mal Mtl S V_1	x (4 TYPES)	Xyl-		
30	65A3, A6, B5 B6		Lac Ara Vl	+-s/++r	000	100	x
31	65D2		Lac Xyl Mtl Mal S	++/+-	Ara- V_1^s	(4 types)	✓
32	65E3		Lac			100 ✓	
33	H3		Lac			100 ✓	
34	66C1	153- C1	Lac ✓ Ara Vl ✓		000 111	✓	
35	66C3-4	C3 C4	Lac ✓ Ara Vl ✓	+ r/- s	000 111	~~[illegible]~~	
36	83A2	173-A2 [3-6]	Lac ✓ Ara Vl ✓		111	011	[000]
37	83E6		Lac		100	✓	

These have all been scored for V_1^r and for Lac+V_1^r (presumably there are no cases of Lac+Vl^s/Lac-Vl^r except 56D1. Lac means that the only detected recombinants were Lac+Ara-Vls. LacVl means that Lac+Vl^r was detected; it does not rule out the additional presence of Lac+Vls or Lac-Vlr, though these are sometimes indicated. Detailed analysis is made only for Lac.Ara cases. For Mal... cases, see detail sheet. There have been no Lac+ S^s/Lac-S^r lacking +r, except 21

Review Hfr pedigrees 1357.

DATE: June 12, 1957. REF: 1184.

(a) Lac Ara V_1 } Review and complete analyses especially for complementarity.
(b) Mal ... S } Handle in 2 groups 1-37 are first group.

If possible revive following stabs. #'s

(a)

3	55D3	= A2	
6	55H5	= D9	
13	56G5	✓	
19	60A2	✓	
22	62H5	✓	
26	63B6	✓	Lac⁻ Ara⁺
30	65A3,6 B5,6 (ABCD)	✓	
34	66C1	✓	
35	66C3-C4	✓ ✓	
36	83A2 (and 3-6)	✓	

grow up in Penassay & recheck Ara, V_1, Lac

b)

7	56B2	✓
8	56B5	✓ ✓
21	61G1	✓ ✓
29	64D3	✓
31	65D2	✓

S^S: Lac⁺ (MMX ⁻/₊) check for Ara⁺ V_1 (Lac, Mal⁺ ...)
(Lac Ara V_1 : ++r/--s)(MMXS ++++/----) Gal⁺ Fla⁻

Same to start.

These cultures had all been mysterious stabs. See comments.

Here, what are specific questions?

a) What combinations of Lac, V_1, Ara? Make fresh check of Lac, V_1 status. Where pedigrees are available, cosegregants should be checked for Ara, V_1 (probably not before).

b) See details.

6/12/57 Resum of zygotes.

All sexed for Lac, Ara, MXM S, Gal.

DATE: REF:

	1	2	3	4	5	6	7	8	Analysis? 9	Sign Judgm 10
51	85 C1		Lac	Ara V$_1$				111,000		✓
52	G2		Lac					100 000		✓
178-180 53	86 A1	A2, B12	Lac	/ Ara •			+ − / − +		✓	
54	C4	C11 C12	Lac	Ara •						
55	F4	F5 F6	Lac	/ Mal •	Ara$^-$				✓	
56	D1	D11	Lac	•						✓
57	G1	G12	Lac	Ara •			− + / + + / − −		✓	✓
	H4	B25	Lac	S	/ Mal Xyl S •		Ara$^-$ / V$_1^S$		✓	✓
	97 D3	145 C3	Lac	S						
60	F4	F4	—	Ara S						
61	H4	DV	Lac	S						
62	1200	D6	Lac	S				000	100	
63		A3	Lac	S				000	100	
197 64	1203	A5 A6	Lac	S						
202 65	1204 D1	D3	Lac Ara	V$_1$ R						
201 66	1205 E4	[illegible]	Lac Ara	V$_1$ R						
67	G4	G6, 16	Lac	S						
204-5 68	1206	2 3	Lac Ara	R / S						✓
69		5	Lac							
70		26	Lac							
71		14=16	Lac Ara	R						✓
72		34=36	Lac Ara	R						
73		41	Lac							
74		43	Lac	R						
206 75	1207	A1	Lac							
76		B5-6	Lac							
77		D1	Lac							
78		F1	Lac							
79		G4	Lac							
80	A4	A2 A5 A6	Lac / Ara							
208-218 81	1210 D1	D5	Lac							✓
82	D4	2 2	Lac							
83	C1	—			Fla / MXM •		Take swarmer			✓
207 84	1207 C1	03 02	Lac Ara							
85	E4	A2	Lac							
86	A4	A6	Lac							
87	D5	D5	Lac							
88	G4	D6	Lac							
40										
50										

38 zygotes.

1357α

DATE: June 14-15 1957. REF:

σ = Lac⁺ Ara⁺ V_1^r = 111
$\bar{g}$ = Lac⁻ Ara⁻ V_1^s = 000

Ecos best isolates from stabs → pure assay on Ara, Lac / T1, sm.

	3	6	13	19	22	26	30A, DA	30B, C	30DB
							found =	=	
Lac T1	+ − R	+ − R	+ − ? R+, − S+	− S	+ − S	− −R −S?	+ − S	− S	+ − +S −R +R?
Ara T1	+ − R	+ − R	+ − +R −S	+ − S	+ − S	+ − +R −S	− S	− S	+ +R − S
SM [Lac, Ara].	R	R	R	R	R	R	R	R	R (~~[illegible]~~)
Infer	1.1 .11	1.1 .11	.11 1.1 0.1 .00	000 010.	.10 1.0	011	100	000	.11 1.0 .00 0.1
			why?			looks for 010 (Ara⁺V_1^s) 001 (Ara⁻V_1^r)			

	34	35A	35B	36	36 -3	-5	-6		21
Lac T1	+ − R [S]	+ − +R −S	+ − +R −S	+ − R	− S	− S	− S		
Ara T1	+ R [S]	+ +R −S	+ +R	+ R	− S	− (+ cont?) −S +R	− (+ c.) −S +R		
SM.	R [redacted]	~~Lac Ara +R~~ −S R	Lac } +R Ara } −S	R	R	R	R		Lac + R } − S }
	1.1 ~~0.1~~	1.1 0.0 ~~0.1~~ 0.0 .01	1.1 0.0 .11	1.1 .11	.000	000	(mixed same? or was ?) 000		
			check sm			check Ara⁺ ~~T1~~			

Discard.

1357
51....

DATE: REF:

	1	2	3	4	5	6	7	8	9	Used
blue print										
A.... ↓			zygotes		casibs....					
	Exp. ☐									
10										
51	1185 C1					already analyzed.			111,000	✓
52	G2					" "			100 000	✓
V1 53	1186 A1		A2 B12							
V1 54	C4		C11 C12							
V1	1178-1180 F4		F6		F5	p.w. Lac Mal!				
V1	D1		D11							
V1 57	G1		G12							
58	H4		B25.....			" "		Ara - V1 S		✓
59	1197 D3		D3		C3 H5					
60	F4		F4							
61	H4		H4		D4					
62	1200 D6		D6							
63	A3		A3							
V1 64	1203 1197		A6		A5					
V1 65	1204 202	D1	D3			Lac Ara V1				
analyze 66	1205 201	E4	E4							
V1 67	G4		15 16							
analyz. 68	1206 204.5		2 3			Lac Ara V1				
69			5							
70			26							
anal 71			14 16			Lac Ara V1				
anal 72			34 36			Lac Ara V1				
73			41							
V1 Lac 74			43			Lac V1				
V1 75	1207 206	A1	A1							
76		B5	B5-B6 = 18,21							
77			D1							
78			F1							
79			G4							
80		A4	A2 A5 A6							
81	207	C1	C3		D2					
82		E4	A2							
83		A4	A6							
84		D5	D5							
85		C4	D6							
86	1210 208-18	D1	d1 d5							
87		D4	g2							
88		C1	..... C1 C2 C1							
50										

DATE: REF:

A vs	7	8	31	29	3/A	3/B	7	8	9	10
Lac	+	+	+	+	+	+				
+TI	+R −S	+S	R	R	S	S				
+sm	+R −R (+S?)	+R −R	+S −R	+S +R −S	+R −R	+R −K				
Ara	+	+	+	+	—	—				
+TI	+R −S	S	R	R	S	S				
+sm	R	R	+ S −R	+S −S +R	R	R				
Xyl	+	−+	−+	—	—	+ −				
+TI	+R −S	S	R	R	S	+S −S				
+sm	R	R	−S −R	+S −R	R	R				
Mal	—	−+	−+	+	—	+ −				
+TI	RS	S	R	R	S	S				
+sm	R	R	−S R	+S −R −S	R	R				
Mtl	—	—	—	+ −	—	— +				
+TI	RS	S	R	R	S	S				
+sm	−R	− R	−R S	−R +S	−R	(+S) −R				

Arabinose 000

needs most. of already isol.

Sal (S?

Not Lac +SR survivor

further tests. 1357

DATE: June 16, 1957. REF:

1357-26. Lac⁻ Ara⁺ ... $V_1^{?}$.
Restreak V_1^{2} segment: any Ara⁻
Restreak whole culture for random tests on Ara⁺.

-3, 6, 13, 34, 35, 36] clearly segregating Lac, Ara + V_1.
1.1 and .11 are identified. 111 needs to be confirmed and others excluded. 1.0 and .10 can be excluded by restreaking V_1^{2} segments.
Reexamine the random strata for 11 vs 01 vs 10.

JUN 17 1957

13.	Lac:	V_1^{2} includes -, + [clulcon Ara: V_1^{2} all+]			011	111
34.	Lac	V_1^{2} is Lac⁺ only.		"		111
3	Lac:	V_1^{R} pure Lac⁺	pure Ara⁺	"	[illegible]	111 .00
36	Lac:	V_1^{2} - 1/>500 Lac⁻	" "	"	111	011 (1)
35A	Lac	V_1^{R} pure +	" "	"		111
B	Lac	V_1^{2} pure +	" "	"		111
36	Lac	V_1^{2} +, some -.	" "	"	(8) 011	111

(right margin, above table: (?) now Infer. also)

all these are mostly if not all Ara⁺. 111 is clearly predominant. no 0.01 in this series.

Random plating.
3 pure Ara⁺ 1/100 Lac⁻ v. small colonies on Blac sem.
6 pure Ara⁺ Lac⁺ Lac sm ok.
13 Lac⁺,⁻ (=) Ara⁺,⁻ Lac sm ditto
" Lac⁺,⁻ Ara⁺⁻
Lac⁺,⁻ Ara⁺⁻ Note parity of Lac⁻ generally + esp. of Ara⁻.
Lac⁺ - pure Ara⁺ Red. S^R
Should check $ for Ara!

(All Lac⁻ V_1^{2} tested, checked as Ara⁺ V_1^{2})

further analyses to protocols · 1357

DATE: 6/19/07 REF:

Single Ara⁻ colonies → ~~Ara~~ Lac, T1.

3: (1) ~~Lac~~ V_1^s — 000

13: (11) Ara⁻ V_1^s — Lac⁻ V_1^s; Lac⁺ V_1^r ← do this Ara⁻? No Ara⁺ (very small pap. prog. orig.) — 000

35A (23) ~~Ara~~ ⁻ V_1^s — 1 mixed, [redacted] — check on Lac! (Ara). — 000 [redacted] → 111?

<u>Replica plating</u>

also:

(3) ~100 Lac⁺ all Ara⁺ V_1^r, also (1) above — 000, 111

(6) ditto — no 000! — 111

(13) Lac⁺ Ara⁺ V_1^R = (1357-13A) — 111
Lac⁻ Ara⁻ V_1^S — Lac⁻ Ara⁻ V_1^R (1) Isolate + check. (other sugars etc.) — 000
Lac⁻ Ara⁺ V_1^R — Replate for Ara⁻ — 011 [redacted]

No Lac⁺ Ara⁻ seen. (about 14 Ara⁻ all Lac⁻)

(34) ✓ ~100 Lac⁺ Ara⁺ V_1^r — 000
5 Lac⁻ Ara⁻ V_1^s — 111

(35A) ✓ 30 each Lac⁺ Ara⁺ V_1^r — 111
Lac⁻ Ara⁻ V_1^s — 000

(36) 30 each Lac⁺ (Ara⁺) V_1^r — 111
Lac⁻ Ara⁺ V_1^r — 011
! no 000
uniform. — but controls are 000

(

~~35~~B. 13 = Ara⁻ Gal⁻. Try Glu! ∴ most 111/000 show no others. Concentrate on others. ↓ SR
Glu⁻ (v. slow also). This is either a mutant or contaminant. Save as 13a

→ June 20. 1957. note difficulty of recovering all original components in present platings! 1307

13. Replate to search other types. Check allelism of 001.

6 " " " Too few Lac⁻.

19. Now pure Lac⁻, Ara⁺/S V_1^S. Check this. Any Lac⁺, -.
isolate sites!

21. "1101" already analyzed: ~~Ara Ara~~ { Lac⁻ . MH⁻S^R Mal⁻Xyl⁻
Lac⁺ < + s + +
- s - - .

what are the Ara⁺ now? Revive earlier isolates.

~~22 plate: almost all Lac⁺. Pyd Ara. all Lac⁺~~

26 plate. Already 011, 000. ? Any 001, 010? 1.00

29 Repeat ~~Xyl~~/S. Any Mal⁻S^s? Were pure Xyl⁻!

30 DB. Ara'/Lac'/V₁'. Plate for types, not yet identified!

31 B Mal ↔ Xyl, MH not settled.

38.

36. now pure? Replate for any Ara⁻. Not worth checking.
Cosets are 000.

51-88 Check V₁.

Plate 18 Lac

V_1 tests + preliminary = "α"
reanalysis Lac Ara V_1 mainly.

1357α

DATE: June 21, 1957. REF:

	1	2	3	4	5	6	7	8 (preliminary)	9	10
				Lac V_1	Ara V_1					
9				−S +R	−S −R			101	000	
10				+− R	−R −S			101	000	
11				−R (+S)	−R −S			001 100		
18				+−R	+R			111?		
	Lac	Ara	Ara V_1	Lac V_1	Ara V_1					
53A	−	+−	−S +R	−R −S	−S +R		011 000	} No 111		
B	+−	−	S	S	−S		100			
54A	−	−	S	S	−S		000	}		
B	+−	+−	+S +R	R +S	−S +R		111 000	} Prev. 00. 11. only		
55A	−	−	S	S			See record for recombinants			
B	−	−	S +R	S			" previously scored.			
56	+	−	−S +R	R			101	... ?		
57	+−	−	+S +R	S	−S			100		
64A	−	−	S	S				000 }	B is recorded	
B	+−	−	−S +R	S (some −R?)				100 }	note.	
65	+−	+−	+R −S	+S −R (+R)	−S +R		011 100 ?	...	See record	
66	+−	+−	+R −	+S −R (+R)	−S +R		011 100 ?	...		
67A	+−	−		S				100 }		
B	+	+−		R				111 }	See Record.	
68A	+−	+−		+S −R (+R)	+S −R	sic	001 110			
B	+−	−		S	−S			100 000		
71A	+−	+−		+S +R	−S +R			(111) 000		
B	+	+		R	+R			111		
72A	+	+		R	+R			111		
B	+	+−		R, S	+S +R			110?	111 000	
74	+−	−		+S +R	All V_1^r is Lac+		101.	100 ...		
75	+−	−		S				100	000	
76A	+−	−		S				100	000	
B	+−	−		S				100	000	
77	+−	−		S				100	000	
78	+−	−		S				100	000	
79	+−	−		S				100	000	
80A	−	−+		R, S	+S −R	sic	see record			
B	+−	−		S	−S					
C	+−	−	−R	+S −R	−R −S					
81	−+	+−		R, S						
82	+−	−		S				100	000	
83	+−	−		S				100	000	
84	+−	−		S				100	000	
85	−	−		S			Record: [100]		000 all now!	
86A	+−	−		S				100		
B	+−			S				100		
87	+−	−		R				101 ...		
88A					−S +R					
B					−S					
C					−S					
Repeat 81 / 74	−S +R / −+	V_1(s)	+V_1s				101 000	011, 100?		

The Gal Vfr problem. 1357-23

DATE: June 21, 1957. REF:

1	2	3	4	5	6	7	8	9	10

Recomb. from stabs.

1163C2.

10 → 1 C1 = 23 C1

10 → 10 → C3., C2 — 23 C2 [000 0000 ½]

23 C3

Ara T1

α: 1 + R
2 − S
3 + R.

In test × Y10/ Mlac W2502, 2302A are *not* fertile. Recheck records!

25 - 26 - 27
1357

26

DATE: 1163136 REF:

1	2	3	4	5	6	7	8	9	10

Recorded earlier as Lac⁻ [illegible].
K: Lac⁻ Ara⁺/⁻ $V_1^{r/s}$
Replicate Ara → Ara T1. Many .00 .11 No .10 .01

011
000.

1? exception retest
This scribbled:
V_1^S

25 Recorded as Lac' Ara⁻ V_1'. Plate + replicate to Blac T1.
all V_1^s are Lac⁻ (>50)
All V_1^r are Lac⁺ "

000
101 only.

27 Lac⁺ V_1^R; Lac⁻ all V_1^S.

000
101.

No evidence on Lac⁺ V_1^s but there are
too few Lac⁺ to tell.

29

1357
29

1164 DATE: 3 REF:

	1	2	3	4	5	6	7	8	9	10

Record:

A, 1	000	0000	0
B, 2	111	0000	0
C, 3	111	1111	0
D, 4	000	1111	0

↖ recorded as $Gal^+ Fla^-$.

My first reading misinterpreted Xyl as Xyl^0. This is based on retests.

6/51. α, Xyl^+S^s/-r.

Some possible Xyl^+S^r mentioned. Notes also ref. Mal^+S^v. Needs retests!

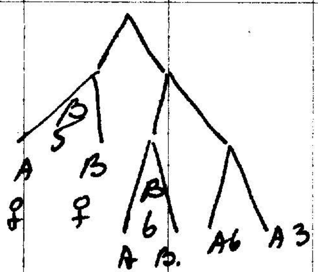
on retests there is nothing in Xyl rx but no Xyl^+. Ignore.

1357
30

✓

DATE: 1163A3 REF:

1	2	3	4	5	6	7	8	9	10



A3 = 30A
A6 = 30B ♀
B5 = 30C ♀
B6 = {30DA
{30DB.

↓ not yet analysed.

∝:
Lac+,- Ara- V_1^s 000 100
000
Lac+- Ara- V_1^s 000 100
Lac+S, -R; +R? Ara+R -S 100 000
111.

30DB - plated. Ara- > Ara+
Lac+ >> Lac-.
∴ must include Ara- Lac+
Ara+ Lac-
prob Ara+ Lac+

Replicate from 6/30
Lac -> Lac, Lac T1, Ara. ⊥

Lac+, -. No 0.1
Many 0.0 1.0 1.1

Ara. 0.0 are all Ara- ∴ 000

000 ✓
111 ✓
100 ✓
No 011

✓000
Ara+ C V_1^r. no .10 < 010, 110
no 0.1 < 001, 011
probably many ✓100
no .01
exceptions are 100 ✓111
to be checked.
probably escapes. ✓ ? 101
000
↳ streak on Ara T1.
~~And~~ + plate on ~~Ara~~ Lac T1. for ~~011~~ No

6/30. On plating of 60DB on Lac T1,
≈100 V_1^r are all Lac+. 1 Lac-, probably
escape but recheck ✓ 000

No. Ara- is V_1^s. all V_1^r are Ara+. but
recheck some exceptions.
No Ara- V_1^s Ara+ V_1^r ∴ No .01 .10

31 A-B.

1307
31

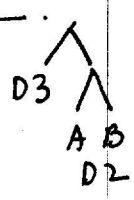
DATE: 11652

REF:

1	2	3	4	5	6	7	8	9	10
Record: B		000 100 100 000	0000 0 0011 0 0000 0 0011 0	A	100	0000			

Now all MH⁻ Xyl⁻ Mel⁻ Ara⁻ mucoid. Mostly S⁺, some Lac⁺, Lac⁻ S⁺. Fimes.

α: Ara⁻ V₁³



1359-
34
✓

DATE: 1166-C1. REF:

	1	2	3	4	5	6	7	8	9	10
	~100 analyses in triplicate.								111 000	
10										
20										
30										
40										
50										

1357
35

DATE: 1166C 3-4 A↓ B↓ REF:

A)

111 / 000 } 10² tested. Lac+,- S^R; Xyl - S^R; Mal -

B)

Lac+ S^S
Lac+ S^R
Lac- S^R ?

Xyl - S^R
Xyl+ S^S (faint papillae)
Mal -.

Plating. Pure Lac+ Pure Ara+ About 10% S^R.

Original records, was Lac +, -. Check S^S for phage.

Good from B Lac.

1. all V,^r. 1/10 of unselected are S^R 9/10 S^S. all Ara+ Lac+.
2.
3.
4.

000

111 0000
111 0001

Look in 35A for 0001 types! Tabbed not 000 left in 3573.

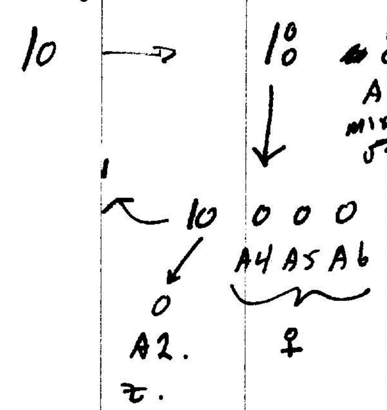
DATE: 1183A2. REF:

sibs. 3-6 checked
d: 000...0

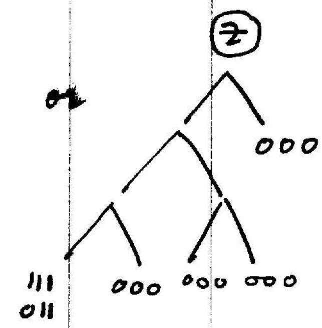
260 repltest, halfrack →. 111 011 (000) ?

look for ~~100~~ 100?

No Aa^- found on replating (>300 Aa^+).

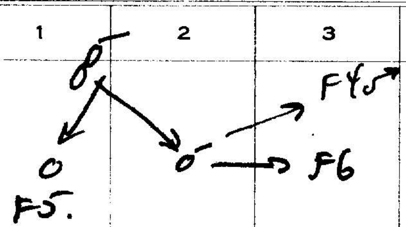


or



most likely

1186 F4. DATE: REF:



Acc. record F5 = ♀

F6 = (Ara⁻ Xyl⁻) Gal⁺ S^R Mtl⁻ (Lac⁻ Mal⁻ / Lac⁺ Mal⁻ / Lac⁻ Mal⁺)

no Lac⁺ Mal⁺

6/507. Only Lac⁻ recovered., Not hopeful for further detail: check on Mal; Recover F6ABC and check these on V_1.

A - A Mal⁻ V_1^S
B Mal⁺ V_1^S
C Mal⁻ V_1^S
O Mal⁺ V_1^S

✓ agrees with record.

~~56: 4 Lac⁻ on V_1? of~~

1307
~~58~~ 58

DATE: 1186H4. REF: ✓

58 Detached pedigree fully analyzed.

B25 and A, B, C, D } all are V_1^s. entire pedigree too.

56 No V_1^s almost pure $V_1^?$. 101. No 000.
~4 apparent 001, look atypical fermentation. cf 13D. Checking the these are tal. slow as 13D. Do not score as 001. Save

65 – 66

1350 ✓
65 ✓
66

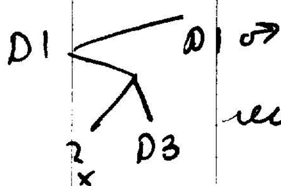
DATE: 1204 - [202] D1   REF: 000 / 111 / 011   1 col.

1	2	3	4	5	6	7	8	9	10

65

D3. α: Lac V_1 +S −R   Ara V_1 −S +R

∴ 011 and 100 probable. Need further analyses.



recorded as Lac', Ara'.

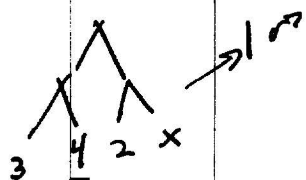
α Repeat: Ara −S +R at least ditto Lac. castes above.

α': V_1^0 Ara^+, Ara^- Lac^+, Lac^- V_1^R Ara^+ Lac^+ only. ∴ 000 and 111 ,01 excluded; 0.1 "

Replica plate: $Lac^+ V_1^R Ara^+$ = 111 and 000 predominate   000 111 ✓

2? 001 at margin, which → 000
1? 011 → 011 sic.

66   1205 E4.   α: as above.



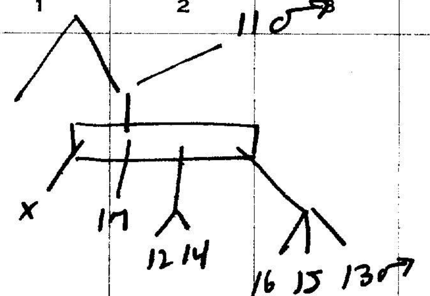
Record: 2, 3 = 000
4 = Lac^0, Ara', V_1'

α: repeat: as above

α': V_1^R: Ara^+ Lac^+ V_1^0 Ara^+, − Lac^+, −   ∴ 000 and 111 / No ~~1.0~~ ~~10~~ → 0.1 ,01

Replica test: Mostly Ara^+, Lac^+. 111 and 00. only
Two dubious 001 at plate margin. Recheck V_1 → 000

~~1205~~-G4. = 1163C2 x C3. REF:



α: and plating [illegible]

Record 15 = 100 - 67A ← lac^+/lac^- all lag^- V_1^S.

16: stated mixture of ♂ ♀ and possible artifact.

Isolation Record:

G4-0   0 0 0 → 0 8 5 → [G4] (1111) x 66   0 0 0 9 6 5 4   F6 G6 00 ~~12 15~~ 14 12   (110)

↳ (1) 0 0
G3 G2 F3
~~65 13 11~~
13 15 16

It seems conceivable that

110 → 11^0_0 → 1 $^1_0$ 0

Alternatively 15 was a holozygote. The irregularity of this pedigree makes it a poor key to decide any issue.

~~Note~~ Isolate components of 16. = 67B. streaks BGal.

↙ mostly Gal+−. pick 2-3 to broths.

1357
68
✓

DATE: REF:

68A.

α: Ara$^+$ V_1^S Ara$^-$ V_1^r (~~Lac~~) ∴ No .11

? Lac$^+$ S − R. :01
.10

Restreak V_1^r, V_1^s BLac

V_1^s Ara$^+$; − V_1^R Ara$^-$ Lac$^+$ ∴ 101

Mostly Lac$^-$ 010

.000

inferred

Replica plate 101 000

Lac T1 most Lac$^+$ are V_1^r, Ara$^-$ Most Lac$^-$ are V_1^S, Ara$^-$

1 Lac$^+$ V_1^S

The plate is too crowded for full screening of Ara/Lac comparisons.

1 probable Lac$^-$ V_1^R Ara$^-$ 001 ~~[illegible]~~

Restreak.

All Ara$^+$ are V_1^S

Ara$^-$ V_1^S

Ara$^-$ V_1^R Lac$^+$ = 101

Types certainly	present	absent	?	restreak these.
	000 010 101	011 111	001	1? Lac$^-$ V_1^R ✓
	001 100	110 n.f.	100 110	} 1? Lac$^+$ V_1^s → 1 101, 6 100

Restreak #3: has some .10

Ara$^+$ spot on BLac to see if 110

No: mixture of 010 and 100.

1357
'71

DATE: REF:

A)

α : $Ara^+ V_1^r$, $Ara^- V_1^s$

$Lac^+ V_1^{??}$ r. s.

hard to read differential. Restrain V_1^s, V_1^r.

V_0 V_1^s $Ara^{+,-}$ Lac^{+-} 000

V_1^R Ara^+ Lac^{+-} (fewer $^-$) ∴ 011 111

looks for 100.

Replica plate (Lac, Lac TI, Ara)

No 1.0 Mostly 11. and 00. All $Lac^- Ara^+$ are V_1^{r2} = 011

No $Lac^+ Ara^-$

No .10
.01

∴ established 000 (all Ara^-).
111
011

No 100 in samples 100 cells. looks for more?

1357
72B ✓

DATE: REF: 111
098

1	2	3	4	5	6	7	8	9

Replica: mostly lac$^+$ ara$^+$. All ~~[illegible]~~ V_1^R are lac$^+$ Ara$^+$
lac, Ara enzyme.

72A also 111 rx

6/22/57

Preliminary resume
51-88

1357

DATE: REF:

#	Exp code	co.	sibs	prelim	scores	6	7	8	data page? 9	Finish
51	1185 C1					111 000				>
52	G2					100 000				>
53	1186 A1	A2 B12				011 000;100	No 111			>
54	C4	C11 C12				000; 111 000				>
55	F4	F6	F5	Lac' Mal'		00;10;01	No 11	V_1^S	•	✓
56	D1	D11				101				
57	G1	G12				100				>
58	H4	extensive pedigree		Lac Mal Xyl....		.00....			•	>
59	1197 D3	D3	C3 H5			100 000				>
60	E4					010				>
61	H4	H4	D4			100				>
62	1200	D6				100				> >
63		A3				100				>
64	1203-197	a5-a6..				100				>
65	1204 D1	D3		011 100					•	
66	1205 E4			011 100					•	
67	1205 G4			100 ;	male?				•	
68	1206 204-5	2;3		001 110;	100 000					
69		5				100				>
70		26				100				>
71		14 16		111 000						
72		34 36		111	110?					
73		41				100				>
74		43		100						>
75	1207 206-	A1				100				>
		B5				100				>
		~~B~~D1				100				>
		F1				100				>
79		G4				100				>
80	A4	A2-5-6		010 001;	000 100;	001 100			•	✓
81	207C1	C3	D2							
82	E4	A2		100						>
83	A4	A6		100						>
84	D5	D5		100						>
85	G4	D6		(100) now 000						>
86	1210 208D1	d1 d5		100; 100						>
87		7D/A g2		101...						
88	C1			Fla+ see pedigree					•	