BA - for serum adaptive enzymes.
Indexes

Enzymes
Lactase + Lactose
Adaptation
Serum (~~[illegible]~~)

18

8838 "protective" R. Abdelhalden. Munch. Med. Wschr. 88:726
5415 localization of lactase in yeast cell See
Hyrbäck K + Vasseur E Z. physiol. ch.
277: 171-180 (1943). T. cremoris
fermented but did not hydrolyse !?

Über die Lactose [illegible]
und die Lokalisation
der Enzyme in der Hefezelle

17 13310 argmaré. See JBC 147:99-108 (1943).
481 } Conzell + Christman JBC 150: 143-154 (1943).
~~16447~~ } Utilization of lactose by the tasting rat.

16 ~~632~~ 15
~~4626~~

Caputto, R., Leloir, L.F., and Trucco, R.E. (1948) Lactase and lactose fermentation in Saccharomyces fragilis. Enzymologia, 12: 350-355.

Extracted adapted yeast cake by adding ½ vol toluene and .2 vol M/2 $NaHCO_3$ and mixing 20 mins. Washed with one vol. water, solid then left 2-3 days with 2 vols .6M KCl. Residue removed. Add .4 vols cold acetone, discard ppt, and ppt active fraction with additional .3 vols. Redissolve in 20 cc .6 MKCl. "When suspended in pure water the enzyme loses about half its activity in 2-3 hrs. AS fractionation gave high losses, but separation from invertase was achieved.

Modified Steinhoff method used for estimation:

I. 7% $CuSO_4$ added to 50g NaAc to vol 100 ml. II AsMo Rx according to Nelson, + 1 vol 1.5N H_2SO_4 JBC, 153,575 '44

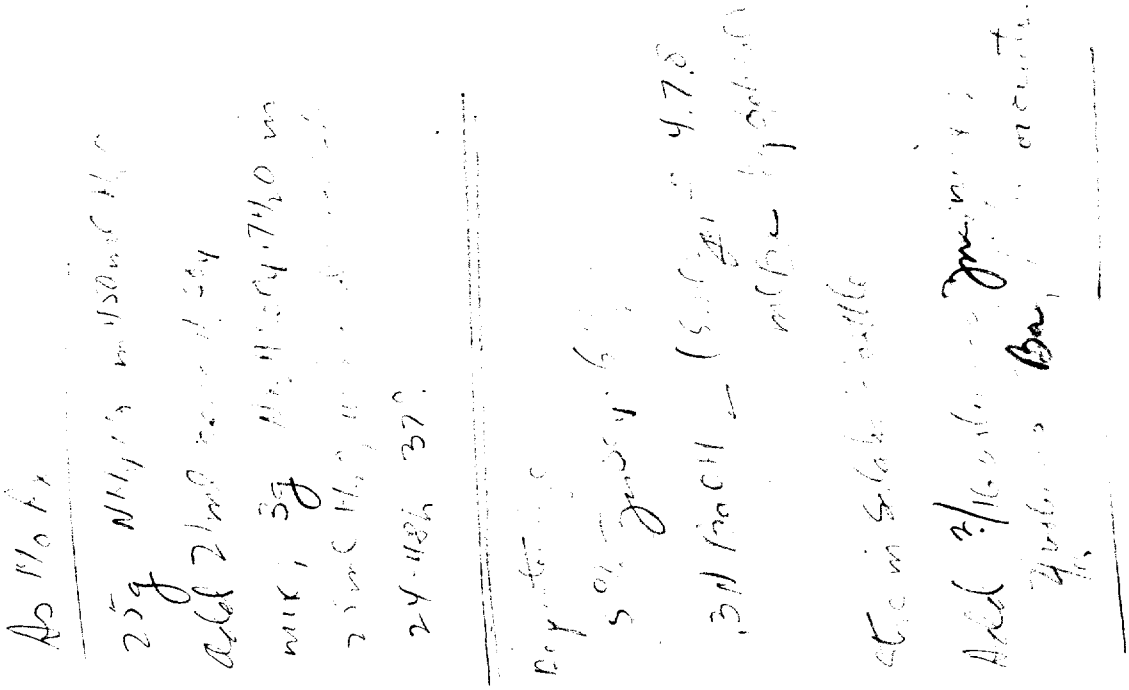
III 5N Sulf ac

2 ml sample, 2 ml I and .4 ml BuOH mixed in tt grad to 10ml. Cover tube with marble and heat at 80 20mins. After cooling, add 2 ml II, 1.5 ml III and water to 10 ml. Mix and read with #52 filter. Found reduction by glu, gal and lac in ratio: 1, 1.2, .016. M/25 Phosphate buffer caused ca 44% inhib., but accounted for with blank and with glucose control.

Lactase: pH opt. 6.7-6.9. Deprot. usually unnecessary. Rather poor linearity illustrated. Apparent phosphate activation noted, but explained as K, and removal of Zn, etc. K, Mn and Mg activated the enzyme considerably. (ca. 10x M/100) Hexokinase studied: fastest with glucose; lactose only after induction (hydrolysis?) Amount of lactase more

than adequate for rate of fermentation, but faster fermentation of lactose than the hexoses not explained.

"In cell-free extracts, toluene treated, or acetone dried cells, glucose fermentation becomes the fastest so that either the enzymes necessary for the direct fermentation are more labile, or the different rates are due to some structural factor such as a differential permeability to lactose."



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9.

cocces #	changing from	3A	3B	3C	5I
1335		++	CL	CL	++
"	(211)	−	CL	++	−
"	(145)	−	+	−	+
"	(1339)	−	CL	CL	−
211		−	CL	++	−
145		−	+	−	CL
1339		−	+	CL	−
1394		CL	CL	CL	++
"	(145)	−	+	−	++
"	(211)	−	CL	++	−
284		CL	++	−	+
"	(145)	−	+	−	+
145		−	+	−	CL
"	(1394)	−	+	−	+
1394		CL	CL	CL	++

similar results in other groups.

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Burnet, F.M. (1927) B.J.E.P. 8:121-129. The relationships between heat-stable agglutinogens and sensitivity to bacteriophage in the Salmonella group.

I	enteritidis	(I), IX, XII
2	typhi	IX, XII, Vi
3	pullorum	IX XII
4	derby	I, IV, XII
5	para B	IV, XII
6	stanley	IV, V, XII
7	reading	IV, XII
8	typhimurium	(I) IV (V) XII

Phages ~~1, 11, 13 + 18~~ 1, + 12 attack typical smooths only of 1, 2 + 3.

Phages 11, 13 + 18 regularly attacked only typical roughs of 1 2 + 3.

Special "r" strains were attacked only by phage 8, which attacked all but a few variants, of 2.

~~18~~ 1R/13 was "smooth", and lysed by 12; it carried 1 lysogenically. 15/12 were "rough" and sensitive to 11, 13 + 18.

φ8 attacked S forms of ~~①, ⑥~~, ①, ②, ③, ⑤ but not ⑥, ④, para A, superstifer., R forms of 1, 2, 3, ⑤, ⑧, ⑨, para A.

φ1 + φ12 attacked typical S forms only of ①②+③+④. no R.

φ11 " most R forms regardless of type. do. 13 + 18.

φ20 " R + S forms of ①, ②, ③ para A

φ21 R + S ①②③ + deeby S.

Conclusion: S phages probably are correlated with the factor now recognized as IX. R are cosmopolitan, as are the serological behavior.

Burnett 1929b. Further Obs. - Kysimt.

φ_8 eq. active on R + S of gallinarum. No serological difference

detectable between S + S/8, or R + R/8. R/8 did not absorb φ_8.

R + S sera showed little cross-reaction. R was obtained with φ_1.

1929a. Classified phages:

A	B	C	D
1, 12, 33	8, 18, 28, 31, 34, 38	20, 25, 32, 35	11, 13

Testing on variants obtained S phage.

A are $S\varphi$.

18, 35, 11 + 13 are R only.

8, 34 are indifferent to R/S. other φ are more active on R than S.

32 + 38 : 32 gallinarum R or S, 38 R only.

gallinarum S/12 were variably "rough" if really resistant, but frequently reacted with both R + S sera. Various colonial types noted.

The mucoids which were found were lysogenic → smooth sensitives.

sensitive to R φ.

All /H were rough. S/8 → smooth; correlated with resistance to φ_8.

Smooth resistants could be recovered from rough strains. Reversibility may be associated c̄ a slight O-agglutinogen content. (Litre ca 80)

R-S-R-S ... could take place.

Burnet 1930) Bacteriophage activity and the antigenic structure of bacteria. J.P.B. 33:647-664.

Table 4. S. gallinarum:

A B C D D'

Discussion of mutant patterns in terms of "change" planes

For some phages, ~~the~~ susceptibility & specificity are uniform in R + S phases.

It is possible that different directions of modification of the O-substance are responsible. In Staph, sensitivity is more closely correlated c̄ serology:

Antigens	Phages 1	2	3	4	
ABC	S	S	S	S	SF
BC	R	S	S	S	SF/1
~~AB~~AC	S	R	R	S	SF/2
ABC	S	S	R	S	SF/3

Table 4. S. gallinarum.

Cells.	A 12	B 39	B 40	B 8	C 18	C 38	D 25	D 35	D' 13	Rough Ben
398S	S	S	S	S	±	R	S	S	R	S
398S/8	S	S	S	R	R	R	S	S	R	S
398S/25	[illegible]	[illegible]	[illegible]	[illegible]	R	±	R	R	R	S
398S/39	S	R	R	S	±	R	S	S	R	S
398R = S/12	R	R	R	S					→	R
398R/8	R	R	R	R	R	R	S	S	S	R
398R/35	R	R	R	S	S	S	R	R	R	R
398R/13	R	R	R	S	S	S	R	R	R	R

Note: R are R to A, B., S to C + D /8 is C_R D_S /13 or 35 is C_S D_R

Burnet, + McKie, (1930) Bacteriophage reactions of flexner dysentery strains. SPB 33: 637-646.

4 groups of phages. E - smooth only.
others - most roughs, some smooths.
antigenic types characteristically different.

Groups C + D are homologous with the Salmonella phages active on rough gallinarum.

Burnet + McKie JPB. 36: 299-306; 307-318 (1933).

The classification of dysentery-coli bacteriophages. I + II. resistance patterns + serology. Some phages may act equally on dysentery R, coli + Salmonella.

pKa (25°)

Acetate	4.76
Barbituric	3.98
Benzoic	4.20
Citric	3.06 [illegible]
Formic	3.75
Lactic	[illegible]
Malic	3.40 5.05
Malonic	3.4
Oxalic	1.19 4.21
Phosphoric	2.12 7.21 12.32
Phthalic	2.89 5.41
Succinic	4.19 5.61
Sulfurous	1.76 7.20
Tartaric	3.02 4.54

Phosphoric ($HPO_4^{=} \rightarrow H^+ + PO_4^{\equiv}$)

or Succinic $H_2Suc \rightarrow H^+ + HSuc^-$

Sulfurous.

Oxalate

Absorption of p20 by W578 and W811. 532

4/20/49

Assayon E. coli B to avoid confusion with λ action

Temperature sensitive resume

W:	31	1	108
	35	20	110
	40	3	124
	42	56	125
	43	58	138
	44	60	137
	45	71	178
	47	78	179
	48	88	200
	65	87	242
	67	83	259
	72	42	305
	74		
	76		

tested for T.S. by E.L.

W305 maybe faster at 37 than at 40.
W110 – at 31 ++ at 40. W42 maybe similar.

Lactulose Ca 1:12 of p. 467-468 NBS "Sugars".

100g lactose in 500 ml H_2O (ca. 75g) sat'd $Ca(OH)_2$ at 55° kept several days. Concentrate in vacuo to wt of 125g. Dilute residue with 125 ml MeOH and cool for crystallization several days. Remove crystal lactose, ca 75g) by filtration + wash c̄ 450 ml MeOH. Concentrate filtrate to a syrup. Dilute c̄ 50 ml H_2O + evap. to remove a c̄. Dilute to 200 ml and titrate c̄ iodine.

5 ml sample. in 200 ml Erlenmeyer. Add 5 ml .1N iodine from burette. Add 7.5 ml .1N NaOH ~~[illegible]~~ dropwise. Repeat for 6 times. (30 ml I_2) Acidify c̄ 10 ml N HCl + back titrate with N/10 $Na_2S_2O_3$. [illegible]. For 2.5 l., B_2 = 1/20 iodine titration of 5 ml sample. Add [illegible] ml [illegible] equivalent. Add 15g $CaCl_2$ / equiv. Add bromine dropwise c̄ mechanical stirring. Remove bromide c̄ Ag_2SO_4 [illegible] per equivalent B_1. H_2S to filtrate to remove excess Ag. Evaporate filtrate to 125 ml to remove H_2S.

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$\sim p \cdot \sim q$

$p \vee q = \sim(\sim p \cdot \sim q)$

$\sim(p \vee q) = \sim p \cdot \sim q$

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