

logous, phage-susceptible parent strain. A typical comparison of fibrinolysin production by parent strain and phage-resistant variant is recorded in Fig. 2. Within the limits of the experimental error the population changes in both flasks were identical throughout the tests so are not recorded in the figure.

From Fig. 2 it is seen that while both flasks produced fibrinolysins at the same rate during the initial stages of population increase, the phage-susceptible parent strains rapidly destroyed or otherwise inactivated the fibrinolytic enzyme after reaching maximum titer. This destruction, however, did not take place (or was counter-balanced by continued fibrinolysin production) with the homologous phage-resistant variants.

If as a result of local phage injections all local streptococci could be destroyed, bacteriophage therapy would presumably aid in preventing the spread of streptococcus infections. The danger of the local production of phage-resistant variants with heightened fibrinolytic function and presumably heightened virulence,² however, would seem to contraindicate phage therapy in local streptococcus infections. This conclusion is in line with the experimental evidence reported by Bronfenbrenner and Sulkin³ in their study of the local therapy in experimental staphylococcus infections in rabbits.

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Influence of Adrenalectomy and Choline on the Fat Content of Regenerating Liver During Fasting.

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Removal of the adrenal glands prevents the deposition of fat in the liver due to phosphorus poisoning,¹ that following the administration of anterior pituitary extracts,² that which generally accompanies total pancreatectomy,³ and also interferes in other cases in which fat may wander from the fat depots to the liver.^{4, 5} Choline prevents the fatty liver which occurs when a diet low in choline or

² Fraser, F. H., and Madison, R. R., *Ibid.*, 1935, **33**, 307.

³ Bronfenbrenner, J., and Sulkin, S. E., *Ibid.*, 1935, **32**, 1418.

¹ Verzár, F., and Laszt, L., *Biochem. Z.*, 1936, **288**, 356.

² MacKay, E. M., and Barnes, R. H., *Am. J. Physiol.*, 1937, **118**, 525.

³ Long, C. N. H., and Lukens, F. D. W., *Am. J. Physiol.*, 1936, **116**, 96.

⁴ Laszt, L., and Verzár, F., *Biochem. Z.*, 1936, **285**, 356.

⁵ MacKay, E. M., *Am. J. Physiol.*, 1937, **120**, 361.

in both choline and protein is fed^{6, 7} but has no effect upon the fatty liver due to phosphorus poisoning^{8, 9} or the other causes noted above,⁹ with the possible exception of pancreatectomy.¹⁰ The comparative influence of adrenalectomy and choline on the fat content of regenerating liver during fasting has been examined.

A very constant average of 65% of the liver¹² is easily removed from the albino rat.^{11, 12} The remnant rapidly increases in size and if the rat is fasted becomes rather fatty, the fat content reaching a maximum in about 24 hours.¹² The experiments reported here were all terminated 24 hours after operation, the animals having fasted during this period but not before operation. Liver fat was measured by the saponification procedure.¹³ When adrenalectomy was performed the glands were removed through the abdominal approach at the same time that the partial hepatectomy was carried out.

The results in Table I confirm the marked consistency in the amount of liver removed¹² by this method.¹¹ They show that more fat is deposited in the regenerating liver of fasting female than male rats (Table I). This is similar to the sex difference in the high liver fat levels reached in rats on a low choline and a low protein diet.¹⁴ Adrenalectomy reduces the deposition of fat in the regenerating liver of fasting rats just as the removal of these glands interferes with fat transport to the liver in many other conditions.¹⁻⁵ Choline, on the other hand, has no influence. In almost every condition in which adrenalectomy prevents the transport of fat to the liver the administration of glucose, providing it is absorbed and may be oxidized, does likewise. In the present experiment also glucose gives the same effect as the removal of the adrenal glands in so far as liver fat is concerned. This point will be considered in more detail elsewhere.

Summary. During 24 hours of fasting after partial hepatectomy (65% of the liver being removed) in the albino rat the liver becomes very fatty. Higher fat levels are reached in female than in male rats. Adrenalectomy prevents a good part of this fat deposition in the liver. Choline is without effect.

⁶ Best, C. H., and Huntsman, M. E., *J. Physiol.*, 1932, **75**, 405.

⁷ Best, C. H., and Huntsman, M. E., *J. Physiol.*, 1935, **83**, 255.

⁸ Best, C. H., MacLean, D. L., and Ridout, J. H., *J. Physiol.*, 1935, **83**, 275.

⁹ MacKay, E. M., and Barnes, R. H., *Am. J. Physiol.*, in press.

¹⁰ Best, C. H., Ferguson, G. C., and Hershey, J. M., *J. Physiol.*, 1933, **79**, 94.

¹¹ Brues, A. M., Drury, D. R., and Brues, M. C., *Arch. Path.*, 1936, **22**, 658.

¹² Raulston, B. O., *Arch. Path.*, in press.

¹³ Leathes, J. B., and Raper, H. S., *The Fats*, London, Longmans, 1925.

¹⁴ MacKay, E. M., *Am. J. Physiol.*, 1937, **119**, 783.

TABLE I.

Exp.	Grp.	Sex	No. Rats	Treatment	Body Wt., gm.	†Body Surface, sq. cm.	Liver per 100 sq. cm. Body Surface		Liver Fat	
							Removed at operation, gm.	When killed 24 hr. later gm.	%	Mg. per 100 sq. cm. B.S.
1	1	♀	5	Control	182	365		.712	17.2	122
	2	♀	4	*Choline	179	360		.850	20.1	171
	3	♀	4	Adrenalectomy	167	344		.598	11.3	68
	4	♂	5	Control	187	371		.797	14.3	114
	5	♂	4	*Choline	189	374		.759	13.7	105
	6	♂	5	Adrenalectomy	190	375		.667	5.4	36
2	1	♀	4	Control	186	370	1.067	1.003	17.9	180
	2	♀	3	Adrenalectomy	176	356	1.078	.688	13.3	91
	3	♀	3	Control	160	334	1.072	1.090	20.7	226
	4	♀	3	Adrenalectomy	190	375	1.032	.689	9.0	62
4	1	♀	3	Control	194	380	1.027	.803	20.1	161
	2	♀	3	"	186	370	1.049	.800	19.7	158
	3	♀	3	†Glucose	195	382	1.280	.739	8.7	64
	4	♀	3	"	186	370	1.001	.686	12.5	86
	5	♀	3	Adrenalectomy	183	366	1.000	.597	11.3	68
	6	♀	3	"	181	363	.996	.532	10.1	54
5	1	♂	5	Control	162	337	1.091	.748	14.8	111
	2	♂	5	*Choline	158	331	1.046	.789	13.9	110
	3	♂	5	Adrenalectomy	161	335	1.078	.612	4.1	25

*40 mg. per 100 sq. cm. body surface of Choline chloride (Merek) in 10% solution by stomach tube at time of partial hepatectomy and repeated 12 hours later.

†300 mg. per 100 sq. cm. body surface of glucose in 30% solution.

‡"Body Surface" calculated from formula of Carman and Mitchell (*Am. J. Physiol.*, 1926, **76**, 380).