LETTERS TO THE EDITORS

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Lactation and Reproduction on Highly Purified Diets

NAKAHARA *et al.*¹ have claimed the existence of specific lactation vitamins, factors L₁ and L₂; they

pups was weaned on diet B suggests that it exerted a beneficial effect.

Notwithstanding that lactation on the experimental diets is sub-normal, members of all four sub-groups of second generation females have weaned pups, so that three generations have been reared so far on highly purified diets in the absence of factors which might be said to be specifically required for lactation.

The experiments are being continued and will be fully reported elsewhere. The helpful advice given

Description of rats	Diet	No. of animals	No. of litters born and av. no. live pups born per litter*	% pups reared	No. of litters reared and av. no. pups weaned per litter	Av. weaning age (days)	Av. weaning weight (gm.)
FOUNDATION STOCK							
(a) Stock colony does	Stock	8	7; 10.8	75.0	7; 6.0	21	41.2
(b) Stock colony does	A	8	8; 5.9	34.8	3; 5.3	30	29.4
1ST GENERATION							
(c) Progeny of (b) ..	A	10†	10; 5.4	15.1	2; 4.0	27	39.5
(d) Progeny of (b) ..	B	6	6; 7.2	41.5	3; 5.7	30	32.8
2ND GENERATION							
(e) Progeny of (c) ..	A	2‡	2; 8.5	0§	—	—	—
(f) Progeny of (c) ..	B	2‡	1; 8.0	0	—	—	—
(g) Progeny of (d) ..	A	3	3; 9.0	25.0	1; 6.0	29	26.3
(h) Progeny of (d) ..	B	3	3; 6.2	27.8	1; 5.0	26	28.8

* Larger litters were reduced to 8 at birth.

† Four of these animals are referred to in both of lines (c) and (d) since they produced their first litters on diet A (of these two were the only ones reared on this diet) and their second litters on diet B.

‡ One female still to be mated.

§ One female afterwards reared, out of eight pups, one ♀, weighing 49 gm. at 33 days.

|| One female afterwards reared, out of seven pups, two ♀♀ and one ♂, weighing 169 gm. at 44 days.

state that, if these are missing from the diet, rats will reproduce but not lactate. We² used a diet which was unlikely to contain these factors, but failed to confirm the finding of the Japanese workers. The recent report, by Rogers *et al.*³, of the successful rearing of two generations of mice on a highly purified diet is of obvious interest in this connexion. We therefore think it opportune to report on experiments of our own in which three generations of rats have so far been born and reared on highly purified diets.

Two main experiments are in progress in each of which the foundation stock consisted of litter-mate stock colony does weaned on to the stock diet² or to a highly purified diet (diet A) consisting of sugar 60, casein (flavin-free) 20, lard 3, groundnut oil 12, salts 5 and supplemented by aneurin, riboflavin, vitamin B₆, nicotinic acid, inositol, choline, Ca-pantothenate, *p*-aminobenzoic acid, 2-methyl 1 : 4 diacetyl naphtho-hydroquinone, cod-liver oil and α -tocopherol, the last two being administered on different days⁴. In view of the claim⁵ that it is essential to add cystine to casein diets to obtain normal lactation in the rat, some animals received the above diet supplemented with 0.2 per cent cystine (diet B).

The results so far obtained in one of these experiments are summarized in the accompanying table which, except where otherwise stated, only relates to the first litter of each female. In all cases the females on the experimental diets were mated with stock colony bucks.

It is evident that the lactational performance of rats receiving the purified diet was always inferior to that of females fed on the stock colony diet. No very definite conclusions can be drawn with regard to the effect of cystine on lactational performance, but the fact that a considerably larger percentage of

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¹ Nakahara, W., Inukai, F., Kato, S., and Ugami, S., *Sci. Pap. Inst. Phys. Chem. Res. Tokyo*, **29**, 47 (1936).

² Folley, S. J., Ikin, E. W., Kon, S. K., and Scott Watson, H. M., *Biochem. J.*, **32**, 1988 (1938).

³ Rogers, L. K., McElroy, L. W., and Cowgill, G. R., *Science*, **95**, 203 (1942).

⁴ Mackenzie, C. G., Mackenzie, J. B., and McCollum, E. V., *J. Nutr.*, **21**, 225 (1941).

⁵ Sure, B., *J. Nutr.*, **22**, 491 (1941).

A Simple Method for Enzyme Concentration

A METHOD for the concentration of enzymes and other biological colloids was recently described by Guy E. Youngbourg¹. By this method the volume of the active solution is reduced by dialysing it against a concentrated solution of dextrin. In a previous paper² concerning the concentration of taka-diaxase it was shown that this method was impracticable for sugar-hydrolysing enzymes, owing to the diffusion of part of the dextrin into the solution. Seeking other methods of concentration, we succeeded in finding a simple procedure by dialysing against 96 per cent ethyl alcohol or acetone as the 'outside solution' (provided only that the active substance is not inactivated by them). By this procedure the volume of the active substance is rapidly reduced. A partial precipitation from the solution during concentration sometimes occurs, but does not interfere with the final result.

The alcohol or the acetone can be regained each