

TABLE I.
Heart: Content per 100 g of Dried Weight.

	No. of rats	Experimental, days	DOCA, mg/day	Water, g	Na mM	K mM	P mM
Control	6	0	0	334	17	37	31
DOCA	6	30	2	355	19	35	29
L.K.	6	30	0	359	15	35	31
L.K. + DOCA	6	4	2	355	21	32	31

DOCA rats received 2 mg of desoxycorticosterone acetate daily for 30 days.

L.K. rats received the diet low in potassium for 30 days.

L.K. + DOCA rats received both the low potassium diet and desoxycorticosterone acetate for 4 days.

and the injections of desoxycorticosterone acetate produce significant lowering of heart potassium in 4 days. It will be noted that heart sodium is raised significantly. The data do not demonstrate that the increase in sodium represents an intracellular replacement of the lost potassium by sodium since the small amount of tissue did not permit chloride analyses. However, such a replacement is almost certainly indicated since heart water is the same in this group as in the other experimental groups and total water would be increased in relation to tissue solids if extracellular sodium were appreciably increased.

In parallel experiments lasting a week, the hearts were saved for histological examination. Lesions consisting of necrosis of the myocardium and cellular infiltration were found in 4 of 6 rats. Since neither the diet low in potassium nor injection of desoxycortico-

sterone acetate produced lesions regularly before 20 days, the combination accelerates the production of lesions as well as brings out the loss of heart potassium.

These findings may have some clinical significance since the administration of large amounts of desoxycorticosterone acetate to a patient receiving a diet low in potassium or large infusions of glucose solutions may lead to loss of muscle potassium. Indeed, certain data⁸ show that continuous infusions of salt solution alone lead to deficits of potassium.

Summary. A diet low in potassium when accompanied by injections of desoxycorticosterone acetate produces in 4 days loss of potassium and gain in sodium in the rat heart. Lesions are induced within a week by this treatment.

⁸ Stewart, J. D., and Rourke, M. G., *J. Clin. Invest.*, 1942, **21**, 197.

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Role of Inositol in Alopecia of Rats Fed Sulfasuxidine.

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Nielsen and Elvehjem¹ reported that feeding of sulfasuxidine* to rats maintained on a synthetic diet resulted in a biotin and folic acid deficiency. This finding was con-

firmed by Welch and Wright,² Martin,³ and Totter and Day.⁴ The present report concerns the effectiveness of inositol in the pre-

¹ Nielsen, E., and Elvehjem, C. A., *J. Biol. Chem.*, 1942, **145**, 713.

* Sulfasuxidine (succinyl-sulfathiazole) was kindly supplied by Dr. W. A. Feirer of Sharp and Dohme, Glenolden, Penn.

² Welch, A. C., and Wright, L. D., *J. Nutrition*, 1943, **25**, 555.

³ Martin, G. J., *Proc. Soc. Exp. Biol. and Med.*, 1942, **51**, 353.

⁴ Totter, J. R., and Day, P. L., *J. Biol. Chem.*, 1943, **147**, 257.

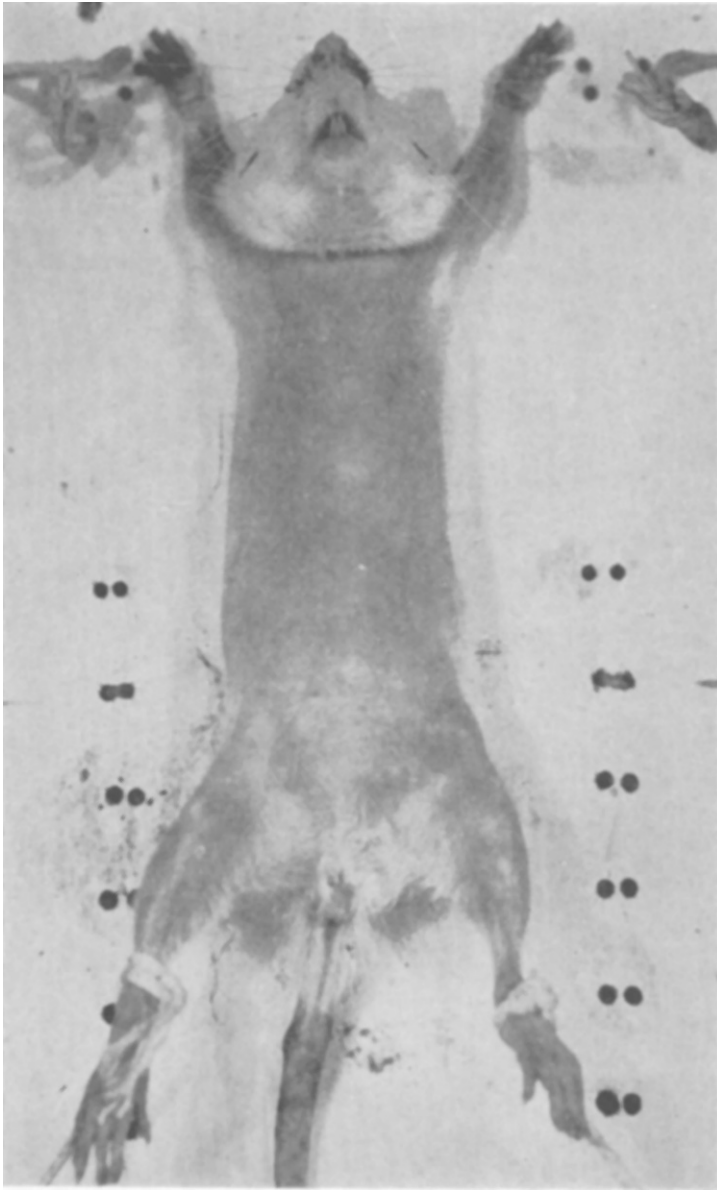


FIG. 1.

vention of alopecia in rats maintained on a synthetic diet containing a sulfonamide.

Experimental. The unmodified basal ration had the following percentage composition: sucrose 73, casein S.M.A. 18, salts IV 4, and corn oil 5. Choline hydrochloride was added to this basal diet at 1 g per kg of ration, while 2-methyl-1,4 naphthoquinone was added at 10 mg per kg of ration. The B-complex vitamins were fed 6 days a week in

supplement dishes at the following levels: thiamine hydrochloride 20 γ , riboflavin 40 γ , pyridoxine 25 γ and calcium pantothenate 200 γ . Two drops of halibut liver oil were given each rat per week.

Albino and piebald rats from our colony were used throughout all the experiments. The litters were reduced to 7 animals and only the 1st, 2nd, and 3rd litters were used. The initial weights were 30-40 g and the average

TABLE I.
Incidence of Alopecia.

No. of rats	Modification of ration	Wt gain 8 wks	Incidence
18	Ration 1% sulfasuxidine	40-50 (16 dead)	4
24	" " " + folic acid + biotin	165	11
24	Purified 1% " " " " " " "	140	20
36	" " " " " " " + 5 mg inositol	174	1

age 19 days. Rats maintained on the above diet grew well and did not develop any symptoms if left on the ration for 15 weeks.

The experimental work was carried out in the following manner. One percent of the sucrose in the above ration was replaced by sulfasuxidine. In this series several deaths resulted after the animals were kept on this regimen for periods longer than 4 weeks. In the surviving animals a low percentage of alopecia was noticed after 6-8 weeks on experiment. In the next series the rats were given daily the equivalent of .5 g of superfiltrol eluate (eluate factor or folic acid) prepared according to the procedure of Hutchings *et al.*,⁵ in their supplement dishes together with the other B vitamins. Biotin was injected intraperitoneally at .25 γ on alternate days. Rats receiving this additional supplementation grew very well and after 6 weeks about 40% of the animals showed marked symmetrical alopecia on the belly and on the hind quarters. The symmetrical alopecia is shown in Fig. 1. Slight loss of hair was noticed in a few animals as early as 2 or 4 weeks on this diet.

In the third series the sucrose and casein used in the ration was purified by refluxing with boiling alcohol for 24-48 hours. In one group of 12 rats alopecia was observed in all animals after remaining on the diet 8 weeks. In another group of 12 rats, 8 animals developed marked alopecia. The purification of the sucrose and casein made it possible to produce alopecia in at least 75% of the rats.

⁵ Hutchings, B. L., Bohonas, N., and Peterson, W. H., *J. Biol. Chem.*, 1941, **141**, 521.

Since Woolley⁶ has shown that inositol is required in mouse nutrition to prevent alopecia, it was suggested that inositol should be investigated. To date we have prevented the alopecia in 36 rats with one exception by feeding in supplement dishes 5 mg of inositol 6 days a week. After definite alopecia had developed 5 mg of inositol was fed daily and definite improvement was noted in several animals after 8 weeks of therapy. In the rats receiving inositol as a preventative measure the fur coat was normal and the luster of the hair was comparable to animals kept on a complete stock diet. The growth over a 9-week period was greater in the male rats receiving inositol as compared to the unsupplemented animals. Those receiving inositol gained on an average 202 g while the negative control animals gained 169 g over the same period. There was no marked difference in the growth of the females.

During this investigation the following diets were tried. The complete replacement of the sucrose by lactose with and without the drug offered no advantage and many early deaths and kidney damage were observed. The casein in the diet was increased to 60% by replacing 42% of the sucrose and no significant differences were noted.

Summary. The inclusion of sulfasuxidine in a synthetic diet allows the development of a symmetrical alopecia in rats. Inositol supplementation prevents the onset of this condition. Animals receiving inositol grow better and have a more tidy appearance.

⁶ Woolley, D. W., *J. Biol. Chem.*, 1941, **139**, 29.