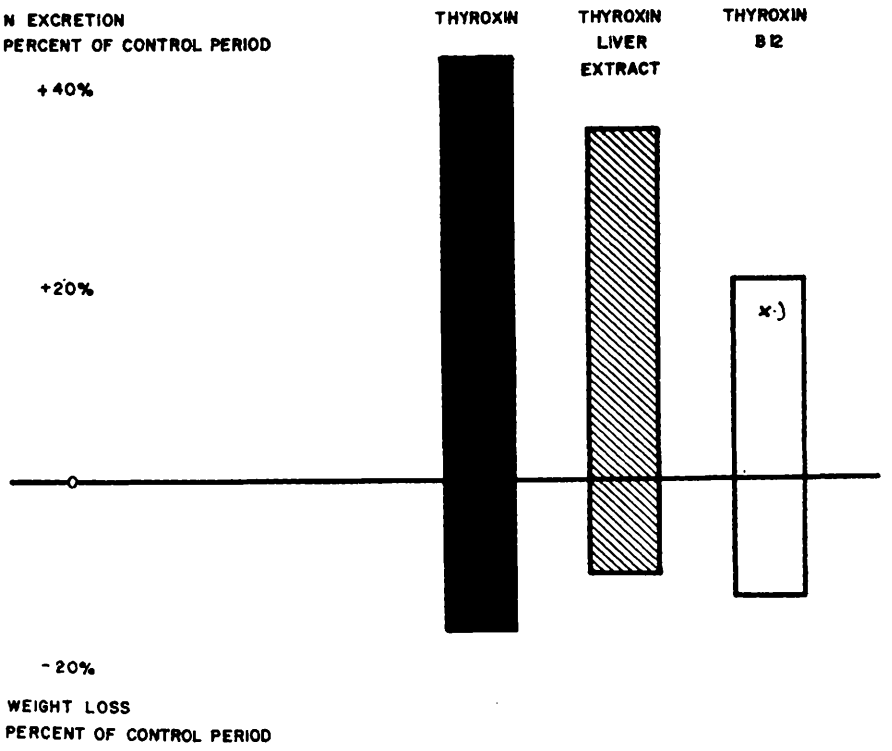

FIG. 1.
N excretion and weight loss. Upper bars indicate increase of N excretion in percent of control period. Lower bars indicate weight loss in percent of weight during control period. x Difference against column one significant $p<0.01$.

ministered to force-fed rats on constant food intake induced neither weight gain nor N retention. When vit B_{12} was administered to force-fed rats on constant food intake, made hyperthyroid by injection of thyroxine, the weight loss was identical with that of hyperthyroid animals not receiving vit B_{12}. The N loss resulting from the catabolic action of thyroxine, however, was significantly smaller in thyroxine-treated rats receiving B_{12} than in the thyroxine-treated controls. Liver extract had a similar action, but the values obtained were statistically not significant. These results suggest that in hyperthyroid rats vit B_{12} spares protein at the expense of other body constituents.

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Effect of Aureomycin and Chloramphenicol on Two Recently Isolated Strains of *Listeria monocytogenes.* (18515)

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A survey of the literature revealed no reports on the effects of aureomycin and chloramphenicol on infections with *Listeria monocytogenes.* Two strains of this organism were recently isolated and found to be virulent for mice. In the present study, the effects of chloramphenicol and aureomycin on these strains were compared *in vitro* and *in vivo.*

TABLE I. Comparative Survival Rates of Mice Infected Experimentally with *L. monocytogenes* and Treated with Aureomycin and Chloramphenicol.

Antibiotic	Dosage†	No. of mice	Strain of *L. monocyt.*	No. surviving at indicated days after infection					% surviving
				5	10	15	20	25	
Aureomycin	10	25	447	25	23	22	20	20	80
"	25	25	447	25	25	24	24	24	96
"*	50	25	447	25	25	25	Not held		100
Chloramphenicol	25	50	447	21	15	15	14	11	22
"	50	50	447	30	20	19	19	15	30
"	100	50	447	29	17	12	12	9	18
Untreated	—	50	447	8	4	3	2	1	2
Aureomycin	25	50	2597	49	49	49	44	43	86
"	50	50	2597	50	50	50	47	45	90
Chloramphenicol	25	50	2597	15	12	10	9	9	18
"	50	49	2597	27	23	20	18	17	35
"	100	50	2597	24	11	10	10	7	14
Untreated	—	50	2597	12	8	8	8	8	16

* Aureomycin 50 mg/kg dose given 4 hr after culture.
† Dosage in mg/kg body wt administered daily for 5 days.

Materials and methods. One strain (2597) of *L. monocytogenes* used in this study was isolated from human spinal fluid; the other (447) was isolated from apparently healthy ferrets(1). Both strains conformed to the morphological and biochemical pattern of the species(2) and both produced monocytosis in rabbits. A third strain (9525), obtained from the American Type Culture Collection, was not lethal for mice in a 10^{-2} dilution, hence was included only in the *in vitro* determinations. The effectiveness of both antibiotics against the organisms *in vitro* was determined by a modified turbidimetric procedure(3). The end point is designated as that concentration of antibiotic which inhibits the growth of the test organism by 50% as determined graphically by plotting the per cent growth $\left(\frac{\text{Optical density test culture}}{\text{Optical density control}} \times 100\right)$ against the logarithm of the antibiotic concentration. A Bagg strain of Swiss mice (11-15 g) was employed for all animal studies. Mice of the maximum and minimum weights were represented in each test group.

Preliminary drug tolerance studies, using a wide range of subcutaneous dosage of aureomycin and chloramphenicol, showed that 25, 50 and 100 mg of aureomycin or chloramphenicol injected daily for 5 days were tolerated, but not 250 mg of aureomycin in 3 daily injections or 500 mg in a single injection. Mice were inoculated subcutaneously with cultures of *L. monocytogenes* grown in dextrose veal infusion broth until 0.145 optical density was obtained at a wavelength of 650 millimicrons. Inocula consisted of 0.5 ml of a 10^{-4} dilution of the standardized cultures. To determine the effect of aureomycin or chloramphenicol on Listeria infection in mice, injections of each drug were given 24 hours after infection and continued for 5 consecutive days thereafter (except in the case of the 50 mg/kg dose of aureomycin, Table I). Aureomycin was administered in 10, 25 or 50 mg/kg daily doses and chloramphenicol in dosages of 25, 50 or 100 mg/kg per day, in 0.5 ml volumes. The chloramphenicol solutions were stored at 4°C, whereas the extremely unstable aureomycin solutions were either freshly prepared daily from the dry state or stored at −70°C.

Results and discussion. The *in vitro* sensitivities for each of the 3 strains tested were identical. Thus, the 50% end points were

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found in tubes containing 0.833 μg/ml of chloramphenicol and 0.050 μg/ml of aureomycin, indicating that *L. monocytogenes* was considerably more susceptible *in vitro* to aureomycin than to chloramphenicol.

The survival rates of animals inoculated with strains 447 and 2597 are shown in Table I. Thus, a significantly greater number (80-100%) survived after being treated with aureomycin as compared with those receiving chloramphenicol (18 to 35%). Only 2% of the untreated controls survived.

During the course of the study it was noted that mice, both treated and untreated, which died more than 10 days after being infected, often exhibited a marked and progressive paralysis. The first apparent symptom was a dragging of one hind leg, followed by partial immobilization of both lower quarters and eventual paralysis of the entire body except for the head. Three of these paralyzed mice were sacrificed and cultures taken from the brain and heart. In 2 instances *L. monocytogenes* was recovered, once from both brain and heart and once from the brain only.

Under the conditions of the experiments reported, five consecutive daily doses of 50 mg of aureomycin per kg of mouse body weight are necessary to obtain 90 to 100% survival of mice infected with *L. monocytogenes*. With the same dosage of chloramphenicol, however, only 30 to 35% of the mice survived. Treatment of the mice with 100 mg/kg of chloramphenicol did not increase the percentage of survivors.

Summary. 1. Aureomycin is more effective than chloramphenicol in inhibiting growth of three strains of *Listeria monocytogenes in vitro*. 2. More mice survived infection with *L. monocytogenes* when treated with aureomycin than with chloramphenicol.

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Succinate Stimulation of Normal and Tumor Tissue Slice Metabolism Measured by Reduction of Tetrazolium Chloride.* (18516)

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Roskelley *et al.*(1) reported that the addition of succinate or p-phenylenediamine to slices of normal tissues resulted in a marked increase in oxygen uptake. In contrast to this, only a minimal stimulation was observed when different neoplastic tissues were studied. In an extension of this type of investigation, Rosenthal and Drabkin(2) found that some normal tissues also tended to yield a relatively low percentage stimulation by these 2 substrates. At the same time, they confirmed the finding of a low response in diverse tumor tissues. By the clever device of studying the response to the substrate in the presence of added cytochrome c Greenstein was able to show that when tissues change from the normal to the malignant state, cytochrome c is diminished to a much greater extent than is cytochrome oxidase. In short, the limiting factor in the substrate stimulation in the experiments discussed appears to be the components of the cytochrome system(3,4). It has recently been shown that tetrazolium salts may be used to measure dehydrogenase activity of tissues both in the absence and presence of substrates(5-7). While the exact site of

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