Amapá, Amazonas and Pernambuco States, no sicklemics were found. These data indicate that the sicklemia test may be useful as an auxiliary test in anthropology.

Emmel's method (*2, 5*) is the most practical for determination of the sicklemia index. It consists in sealing a drop of blood between slide and cover slip with vaseline, balsam, or any similar substance. Results should be read at the end of 6 hrs at the earliest, but 24 hrs is preferable. This delay has been removed by using a highly reducing substance (sodium hydrosulfite), with which sickling begins to show in a few minutes. The diagnosis can be made in 15 min. A drop of 2 gm of sodium hydrosulfite per cent solution in saline is placed on a slide and a drop of blood mixed with it. After being covered with a cover slip, the slide is examined under a microscope. No sealing is needed.

Detailed articles on these studies will be published in the *Memorias do Instituto Osvaldo Cruz.*

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Nutritional Requirements of the Rat for Reproduction and Lactation[1]

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It has been generally assumed that the requirements in the rat for lactation are greater, qualitatively, than those for reproduction, and many investigators have attempted to find new dietary factors exerting a specific effect on lactation. This viewpoint can be summed up in the words of Nelson and Evans (*2*): "The requirements for growth in weanling rats and for reproduction are satisfied . . . but the function of lactation has additional dietary requirements."

In humans, according to Macy (*1*), "the evidence indicates that the well-being of the child before birth and after are influenced by the nutrition of the mother before and at the time of conception and by the adequacy of her diet during pregnancy."

Observations made in this laboratory lead us to believe that reproduction has dietary requirements as great qualitatively as lactation and that there are no specific dietary factors required for lactation only.

Birth weights of rats have been determined in 117 litters born to mothers on stock and experimental diets. The basal experimental diet (diet R-5a) consisted of casein (Labco) (30%), sucrose (48%), salt mixture (5%), Ruffex (2%), lard (5%), hydrogenated vegetable oil (10%), and contained the following supplements per kilo of diet: thiamin, 20 mg; riboflavin, 20 mg; pyridoxin, 20 mg; calcium pantothenate, 40 mg; α-tocopherol, 20 mg; vitamin A concentrate, 67.5 mg (67,500 I.U.); vitamin D (Drisdol), 5,000 units; and choline chloride, 500 mg. The other experimental diets were modifications of diet R-5a and contained such supplements as folic acid, biotin, xanthopterin, and milk. Stock mothers received Rockland diet.

TABLE 1

DATA SHOWING THE RELATIONSHIP BETWEEN BIRTH WEIGHT AND CAPACITY TO SURVIVE IN RATS

	Group I Young born in surviving litters	Group II Young that failed to survive
No. of litters	71	46
No. of young	537	327
Avg. weight at birth (gm)	5.7	4.9
No. of young below 5.0 gm	22	155
Percentage of young below 5.0 gm	4.1	47.4
No. of young above 5.4 gm	399	31
Percentage of young above 5.4 gm	74.3	9.5
No. of young given to nurse	383	
No. of young weaned	356	
Percentage weaned	92.9	

The young have been divided into two groups. Group I comprises young born in surviving litters, and Group II includes litters in which none of the young survived the lactation period. The results are summarized in Table 1. The average weight of the surviving group was 16.3% greater than that of the nonsurviving group. The high percentage of young weaned in Group I indicates that viable, healthy young were included in this group. In this laboratory it is customary to reduce litters to 6 young on the third day of lactation. This accounts largely for the difference in the number of young born and the number given to nurse.

The distribution of young according to birth weight has been plotted (Fig. 1). It will be noted that the surviving young are grouped largely about the average, while nonsurviving young are more scattered. It appears that a birth weight of 5.0–5.4 gm is the critical range, lighter young having little chance of survival, while a heavier weight does not preclude the possibility that the young will fail to survive due to other causes. Especially significant is the fact that 74.3% of surviving young weighed over 5.4 gm, while only 4.1% weighed under 5.0 gm. These figures compare favorably with those obtained for the nonsurviving group.

[1] This investigation was aided by a grant from the Nutrition Foundation, Inc., New York. A preliminary report of the study has appeared (American Chemical Society Abstract, New York Meeting, September, 1947).

A study of the weights of litters at birth shows no relationship between these figures and the number of young in a litter. In the surviving group two litters of 13 have been cast, weighing 73 and 78 gm, respectively; one litter of 16 weighed 91 gm. In the group which failed to survive, litters of 13 and 14 young were also cast. Here, however, the weights were uniformly lower.

Another aspect of this problem which we consider of great importance concerns the ability of the young rat to survive the first three days after birth. We observed that while some young survived as long as 12 days, the majority were eaten by the mothers or died by the third day of lactation. Of 46 litters in which young failed to survive, 29 litters failed to survive the third day of lactation. This is a critical period in the life of the young rat. Deaths during this period should not be classified as lactation failures. We believe the causes of such failures can be traced to the reproduction process.

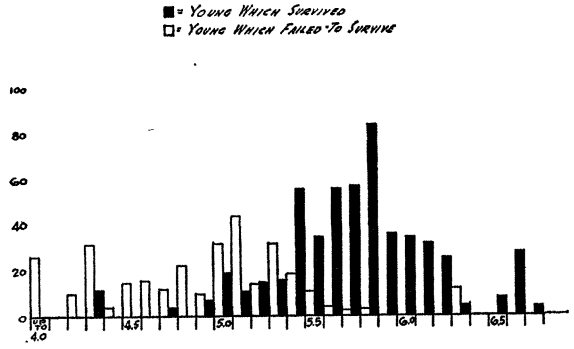

FIG. 1. Distribution of young according to birth weight.

The weights of the young at birth, coupled with survival data, can be used to show the adequacy of diets. For example, 27 litters were cast on the stock diet. The young in 4 litters failed to survive. Birth weights of these young fell in and below the critical range. On the unsupplemented diet, R-5a, 7 of 10 litters cast failed to survive. The young in only 1 of these 7 litters had birth weights above the critical range and represent a litter which we would normally expect to be weaned.

It appears that, regardless of diet, the survival of newborn rats is dependent largely upon their weights at birth. In our opinion, a diet which is qualitatively adequate in all respects for reproduction will also be adequate for lactation. Our results indicate that there are no dietary factors which are necessary for lactation only.

We propose that, in studies on rats, the weights of the young at birth be used as the first indication of the adequacy of a diet, and further, that lactation success in rats be calculated on the basis of those young and litters surviving on the third day of lactation.

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The Spinal Anaesthetic Effects of Ephedrine Sulfate: A Preliminary Report

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The addition of ephedrine to spinal anaesthetic mixtures for the purpose of prolonging spinal anaesthesia is now a rather common practice (*1*). Except for the work of Schultz (*2*), who found that ephedrine was a spinal anaesthetic in frogs, this action of the drug has not been investigated. For this reason we have tested ephedrine for its spinal anaesthetic properties by injecting it subdurally prior to giving spinal anaesthesia and noting the resultant anaesthetic effects. This constitutes a preliminary report of our findings.

Fifty mg of ephedrine sulfate in triple-distilled water was mixed with 1 cc of spinal fluid. The mixture was slowly injected into the subdural space through a lumbar puncture over a period of 1–2 min. For 20 min after the injection, the patients were tested for loss of pin prick sensation and of anal sphincter tone. Effects were usually noted after 10 min or more, and were most frequently seen in the area supplied by the second, third, and fourth sacral nerves. Some loss of sensation was noted as high as the eighth dorsal cutaneous segment.

All of the 15 patients given ephedrine subdurally showed some diminution of pin prick sensation which varied from slight hypesthesia to anaesthesia. Anal sphincter tone was sufficiently diminished to admit two or more fingers without discomfort in 6 of the patients who were tested for this. No other paresis was seen.

None of the patients showed such systemic effects of ephedrine administration as elevation of pulse and blood pressure. Many exhibited the warming of the lower extremities associated with lumbar sympathetic nerve paralysis, and a few showed the drop in blood pressure often seen in spinal anaesthesia.

In some cases ephedrine anaesthesia was adequate for operation without the addition of a standard agent. An example of this was the 43-year-old woman with diabetic infection of the foot. Two toes were amputated and extensive incision and drainage of the foot was done under the spinal anaesthesia produced by 50 mg of ephedrine. The patient was not excessively sedated, responded accurately to questions, and cooperated well. When questioned later, she said that she had felt the operation but had had no pain.

The anaesthetic effect of ephedrine should be considered when adding this drug to spinal anaesthetic mixtures.

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