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**Relation of Food Consumption of Milk-fed Rats to the Growth of the Suckling Young.**

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In a recent investigation<sup>1</sup> it was pointed out that the failure of milk fed rats to successfully suckle their young is not due primarily to a deficiency of the antineuritic vitamin in the milk secretion as has been suggested by a number of investigators,<sup>2</sup> but to the inability of the particular rat to ingest enough milk to meet the lactation requirements. In this investigation the mother animals were transferred from the stock ration to the milk diets just previous to or immediately following parturition.

In order to rule out the possible criticism that the results in this previous investigation were vitiated by a carry over of the antineuritic vitamin from the prelactation period when the animals were receiving high vitamin diets, we have fed groups of rats from infancy (4 weeks) both evaporated milk, which has been shown to be lower in the antineuritic vitamin than quickly boiled milk, and dried partially skimmed milk supplemented with butter fat to make it comparable to the evaporated milk. Certain of these groups were given a concentrated alcoholic extract of wheat embryo, calcium phosphate, and viosterol, either singly or together, while others received the milks without these additions. Small amounts of copper, iron, and iodine were added to all diets.

The females in all groups bore young. Shortly after birth the number in the litter was reduced to 6. In some cases the number born was less than 6 or the young died during the first days following parturition, so that there was some variation in the number raised. The food ingestion was measured throughout the lactation period (21 days) and the caloric ingestion evaluated in relation to the body weight of the mother.

All mothers receiving the dried milk during the lactation period gained in weight, whereas those receiving evaporated milk, with one exception, lost slightly. The addition of the wheat embryo extract to the dried milk fed group showed no influence on the food ingestion of the mother, the percentage of weight gain of the mother,

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<sup>1</sup> Daniels, A. L., Jordan, D., and Hutton, M. K., *J. Nutrition*, 1929, ii, 19.

<sup>2</sup> Sure, B., *J. Biol. Chem.*, 1925, lxii, 371; lxiii, 211. Evans, H. M., and Burr, G. O., *J. Biol. Chem.*, 1928, lxxvi, 263.

or the size of the young. Similarly the addition of the wheat embryo extract to the evaporated milk groups did not influence the food ingestion nor the weight of the mother.

There seems to be a relation between the amount of food ingested and the gain in weight of the young in each group. The average weekly gain of the young of the animals receiving the dried milk feeding was greater than that of the young of mothers fed the evaporated milk. The caloric ingestion of the former group was slightly greater. Our results with dried milk are comparable to those previously reported. There is no evidence that the prelactation carry over of Vitamin F influenced our previous results to any great extent. The dried milk tested contained enough of the anti-neuritic vitamin for normal growth, reproduction, and successful suckling of 6 young. Our results with evaporated milk, on the other hand, suggest that some essential constituent may be low, since optimum results were obtained with none of these groups. The results with the Vitamin F additions were slightly better than those without this addition. However, the differences between the animals receiving Vitamin F addition and those not getting it were not sufficiently outstanding for us to conclude that this vitamin is the lacking substance.

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### Vitamin F in Relation to the Development of the Thyroid and Thymus of Suckling Young.

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When high protein diets, adequate in all the known dietary constituents excepting Vitamin F, are fed to lactating rats, the young, besides manifesting the untoward symptoms previously described,<sup>1</sup> give evidence of abnormal glandular development. The thymus gland is much smaller than that of normal animals of the same age or weight, while the thyroid is much larger. Among our stock fed

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<sup>1</sup> Hartwell, G. A., *Biochem. J.*, 1922, xvi, 825; 1925, xix, 227; Nelson, M. P., *J. Home Econ.*, 1926, xviii, 383; Daniels, A. L., and Brooks, L., *Proc. Soc. Exp. Biol. and Med.*, 1927, xxv, 161; Daniels, A. L., Giddings, M. L., and Jordan, D., *J. Nutrition*, 1929, i, 455; Lawrence, M. R., *Dissertation*, State University of Iowa, 1929.