

This Week's Citation Classic

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Chow B F & Lee C J. Effect of dietary restriction of pregnant rats on body weight gain of the offspring. *J. Nutrition* **82**:10-18, 1964. [Johns Hopkins University, Baltimore, MD]

Dietary restriction imposed on mother rats during gestation alone or gestation and lactation periods resulted in growth stunting, anemia and decreased resistance to hypothermia in progeny. Injection of pituitary extract or growth hormone shortly after weaning could correct the growth stunting effect. [The SCI[®] indicates that this paper has been cited over 140 times since 1964.]

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"It was often mentioned by the late Dr. Bacon F. Chow, that the idea of studying the effect of dietary restriction during pregnancy on the offspring was triggered by a question raised by one of his graduate students almost 30 years ago at The Johns Hopkins School of Hygiene and Public Health. The question concerned the exclusion of runts (small young) from rat experiments. The answer at that time was that they were too small. Dr. Chow then decided to study the disadvantages a runt might have. In 1954, he found that all progeny were permanently stunted when their mothers received only 50% of the quantity of diet during gestation and lactation that was eaten by normal pregnant rats. Dr. Chow had difficulty in publishing his results because most of the reviewers of nutrition manuscripts believed that the growth stunting effect on the progeny was due to some undetected infectious disease that existed in the rat colony. When a new graduate

student — C.J. Lee, arrived in 1963, he experimented so carefully and reproducibly that his results led to the publication of this paper.

"I believe that the reason for this paper being cited frequently is because it challenged with experimental evidence the tradition that a fetus would extract its needs even at the expense of the mother. Since that paper was published many others along a similar line have appeared.

"Dr. Chow's ultimate goal was to find out whether the results seen in animal studies were also true in humans. He conducted a nutrition supplementation study in Taiwan, in which pregnant women received a daily protein-calorie supplement during gestation and lactation periods. Infants born to these mothers were compared to infants without such supplement. Anthropometric measurements, developmental assessment (using Nancy Bayley test) and nitrogen utilization (using nitrogen balance technique) were evaluated. The results of this study have recently been analyzed and hopefully they will be published. From what we have seen in the data, any benefit of the supplement to either the mother or offspring was small. This may indicate that the dietary intake of the women in the study area was not as marginal as was originally thought. It is perhaps more likely that the proportion of progeny to maternal weights is so much lower in humans than in rats that a reduced diet that would yield smaller rats might not produce a detectable change in humans.

"Several other human nutrition supplementation studies have been carried out by different laboratories. When the results from all these studies are available, one may obtain a clearer picture of whether dietary supplementation is beneficial to the offspring in humans."