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EFFECTS OF PRE- AND POST-NATAL
MALNUTRITION ON BRAIN PHYSIOLOGY

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B. S., Southwest Missouri State University, 1968

A MASTER'S REPORT

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Foods and Nutrition

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1977

Approved by:


Major Professor

Document
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1977
C68
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**THIS BOOK
CONTAINS
NUMEROUS PAGES
WITH DIAGRAMS
THAT ARE CROOKED
COMPARED TO THE
REST OF THE
INFORMATION ON
THE PAGE.**

**THIS IS AS
RECEIVED FROM
CUSTOMER.**

INTRODUCTION

In recent years scientists, politicians and journalists have shown increasing interest in the incidence of malnutrition in infants and children and its effect on brain development. Estimates of the number of children suffering from some form of undernutrition are staggering. Some ten million children are severely undernourished, 80 million are moderately undernourished and 130-160 million are experiencing mild undernutrition (1).

Studies attempting to show a cause and effect relationship between the effects of pre- and post-natal malnutrition on brain development and subsequent mental development have received widely publicized attention. Whether there may be a correlation here as pointed out by Winick (2) or just one parameter operating in a poor environment (1, 3), the issue is one that requires continued investigation.

MALNUTRITION, BRAIN GROWTH AND DEVELOPMENT AND MENTAL CAPACITY

Effects on Brain Growth and Development in Experimental Animals

Studies investigating the effect of malnutrition on brain growth and development have produced varying results. This has been due in part to the animal studied and the duration and timing of malnutrition. Animal species differ regarding the pre- and post-natal stage of brain development. Figure 1 represents the timing of birth in relation to the brain "growth spurt," the most rapid phase of brain growth (4).

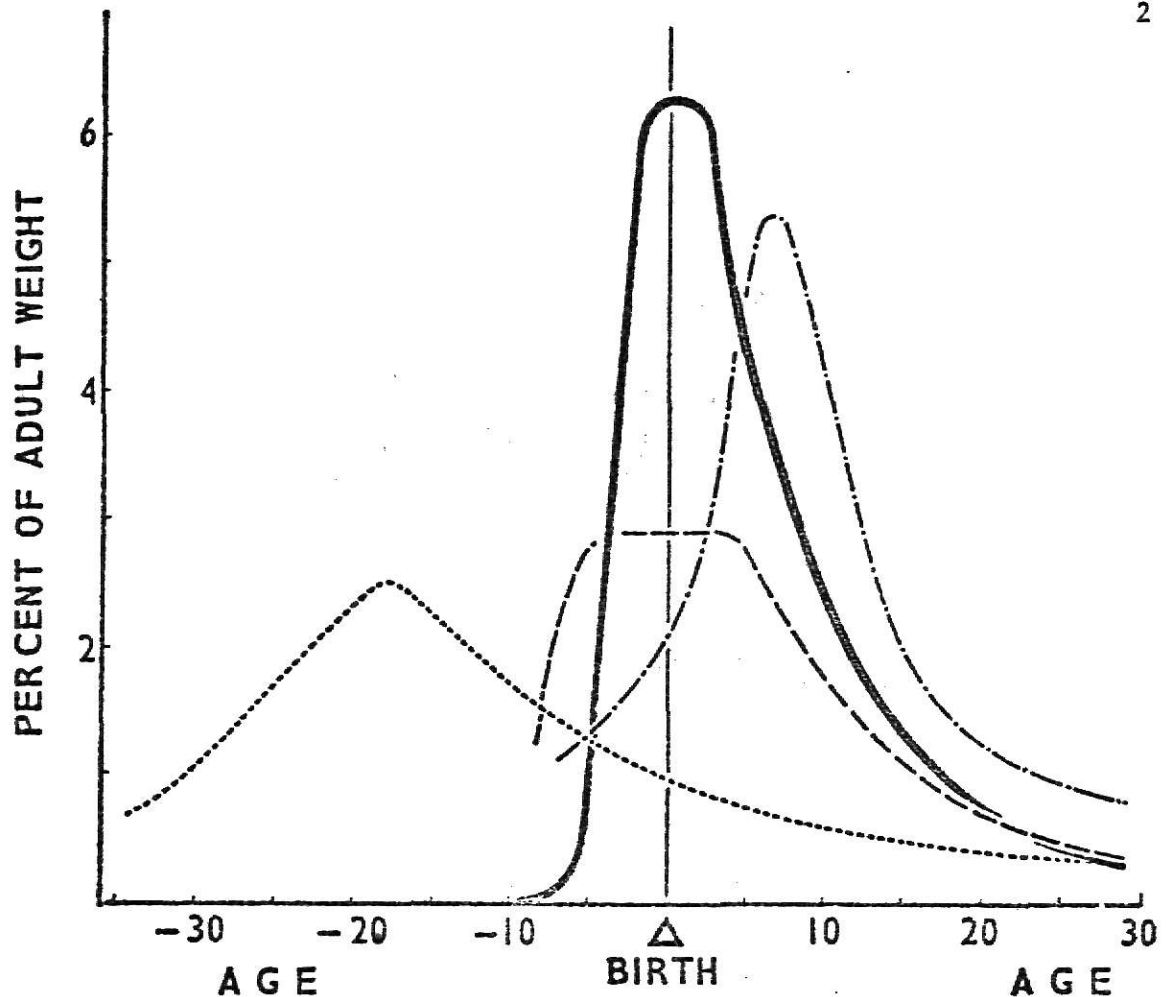


Figure 1. Velocity of human brain growth (wet weight) compared with that in other species. Prenatal and postnatal age expressed as follows: human _____ in months; guinea pig ----- in days; pig - - - - in weeks; rat in days (4).

The concept of heightened sensitivity of the brain to the effects of malnutrition is related to this period of rapid brain growth. The effects of malnutrition induced post-natally on the brain of the guinea pig would be expected to be different from the effects of malnutrition imposed at the same time on the brain of the rat.

Within the same species the effect of malnutrition at various stages of pre- and post-natal development would be different. If malnutrition occurred during the period of hyperplasia (growth by increase