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Nutrition of the Pregnant Woman

Quantitative data for energy metabolism in pregnancy are scarce, because the techniques are difficult to carry out and are demanding on the women. As J. Omatsu[1] charmingly expressed it: "Their cordial co-operations are highly required."

One estimate[2] suggested that the running costs of pregnancy (which do not include the cost of *stored* energy) increase progressively to about 200 kcal per day in late pregnancy, and give a cumulative total for the whole of pregnancy of a little over 26,000 kcal. A remarkably close confirmation of that estimate, 27,100 kcal, was found for 11 normal Boston women in a painstaking study which required their spending one week in every four in a metabolic ward.[3]

To those basal metabolic requirements must be added any extra cost of activity in pregnancy, and since the pregnant woman is heavier than before pregnancy any activity such as walking should cost her more. But the pregnant woman, at least in most Western countries, is notably less active than before pregnancy, resting more and performing tasks with greater economy of effort,[2] so that any extra energy costs that may attach to particular forms of activity are offset, or more than offset, by her general relaxation. On that basis K. Emerson and his co-workers in the Boston study concluded:

"The increased caloric cost of pregnancy is due entirely to the growth and metabolic requirements of the products of conception and the adaptive changes in the maternal organism. No increased allowance need ordinarily be made for maternal physical activity, as long as adequate structural protein and other essential nutrients are provided. The addition of 12 ounces [340 g] of homogenized milk to a well-balanced diet, which maintains a normal non-pregnant woman at constant weight and in good health, is sufficient to meet all extra energy requirements of pregnancy. . . . "

While that simple suggestion puts the specific running costs of pregnancy neatly into perspective, it might be unfortunate if it were interpreted as being the final scientific verdict on the total extra cost. The Boston women, like many American women, were subject to dietary restriction so that their total weight gain averaged only 8·3 kg, a figure which just covers the weight of the product of conception, the increased weight of the uterus and breasts, and the expanded maternal blood volume.

Women whose intake is not deliberately restricted will gain on average half as much weight again—about 12·5 kg—and most of the additional 4 kg appears to be depot fat. The energy cost of that, plus the energy equivalent of the tissue in the product of conception and the uterine muscle, which does not appear to have been accounted for by Emerson and his co-workers, raises the cost estimate by a further 40,000 kcal. Because the fat is stored early in pregnancy, the costs are evenly spread at the rate of about 350 kcal per day over the last two-thirds of pregnancy, but in practice, because the mother usually cuts down physical activity in pregnancy, the daily increment amounts to only about 200 kcal.

Whether the mother's natural surge of appetite which results in her storing fat should be taken as the best guide to her dietary intake is a question of philosophy rather than of science. Under the conditions of modern urban civilization the energy reserve represented in stored maternal fat is seldom needed, but it is not, as many fear, a cause of obesity, because the excess is usually lost between pregnancies without any conscious effort.[4] But in conditions of uncertain food supply, particularly in those parts of the world where the economy depends on hard physical work by women, an energy reserve could be an important nutritional buffer for the fetus.

At present the best guide to adequate nutrition in pregnancy is the mother's weight gain, and a mean gain of between 0·35 and 0·55 kg (¾ to 1¼ lb) per week is consistent with excellent clinical results.[5] Moreover, if those energy needs are met by a reasonably varied diet, the major individual nutrients such as protein will be in more than adequate supply.

[1] Omatsu, J., *Kobe Journal of Medical Science*, 1957, **27**, 21.
[2] Hytten, F. E., and Leitch, I., *The Physiology of Human Pregnancy*, 2nd edn. Oxford, Blackwell, 1971.
[3] Emerson, K., Saxena, B. N., and Poindexter, E. L., *Obstetrics and Gynecology*, 1972, **40**, 786.
[4] Billewicz, W. Z., and Thomson, A. M., *British Journal of Preventive and Social Medicine*, 1970, **24**, 97.
[5] Thomson, A. M., and Billewicz, W. Z., *British Medical Journal*, 1957, **1**, 243.

Resources and Needs in Africa

The problems of medical practice and education in developing countries have been much discussed in terms of their relevance to the community's needs. The reason for this emphasis is partly historical. When the physicians and surgeons trained in the medical schools of Great Britain and Europe became teachers in developing countries, they brought with them an experience and training that required considerable modification if they were to be of value in the