

# MATERNAL NUTRITION

Pages with reference to book, From 152 To 154

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The diet of an expectant mother can affect her baby's health and her own comfort. To adequately stand the stress of pregnancy and labour she should be nutritionally well prepared and physiological requirements during pregnancy should be properly supplied, as the deficiency diseases bring crushing burdens and start tragedies. A large part of maternal disease is chemical rather than bacterial in origin and therefore trouble may be either excess or deficiency for e.g., anaemia, pre-eclampsia, eclampsia, hypertension, antepartum haemorrhage and post-partum haemorrhage, Osteomalacia and osteoporosis may also result, as malnutrition practically affects all organs in the body including bone density of mother herself and also that of the newborn<sup>1</sup>. Maternal malnutrition impairs fetal growth and results in low birthweight undernourished neonates which have an increased frequency of long-term mental and motor impairment<sup>2,3</sup>. Total physiological requirement during pregnancy are not necessarily the sum of ordinary non-pregnant requirements and those specific to pregnancy. The estimated additional cost of pregnancy during its final quarter is 250 K. cal daily on average, which is only about one quarter of the ordinary expenditure on activity envisaged for the non-pregnant woman<sup>4</sup>. The energy cost of pregnancy could therefore be met without additional supplies from the diet by reducing activity. Some reduction of activity seems to be usual during pregnancy. Knowledge and understanding of metabolic adjustment during pregnancy is still incomplete. The energy metabolism becomes more efficient and there is major modification of mother's energy balance which leads to the storage of some 3.5 to 4 Kg<sup>5,6</sup> depot fat. This is one of the important protective device for the fetus. Stimulus to accumulate this large extra fat is partly through the appetite satiety centre and mainly by a more fundamental change in the control of energy balance probably caused by progesterone. Metabolic adjustment of pregnancy are well established often fully during the early weeks of pregnancy and are widespread, complex and fundamental. Nutritional balances are positive that is anabolic. Many physiological changes which characterise pregnancy do simulate pathology in the non-pregnant state, but in healthy pregnancy milieu interior undergoes a substantial change. Thus the concept of fetus being a parasite upon a normal non-pregnant metabolism does not appear to be tenable.<sup>5</sup> The specific nutritional cost of pregnancy can be divided into "capital cost" the value of tissue laid down by the mother and the product of conception and "running cost", the cost of extra metabolism of pregnancy. The extra nutrients for the fetus and placenta are required from 20 weeks onwards.<sup>6</sup> Recommended daily dietary allowances during pregnancy proposed by the agencies of the United Nations, by the official bodies in the United Kingdom and the United States of America and Pakistan Planning Division are 2550 K. cal, 2200 K. cal, 2400 K. cal and 2510 K. cal respectively. Asian mothers probably need a better nutritional status as compared to their European counterpart to achieve same birthweight babies. This is probably because of genetic factors<sup>8</sup>. Most important is total calorie intake, irrespective of the source in nutritionally at risk mothers<sup>9,10</sup>. Total protein intake is important for mental health<sup>11</sup> and protein which can be utilized completely such as that of whole egg or milk. There is increased efficiency of protein metabolism and small extra amount required are recovered adequately by or normal diet. Intake of folate, iron, calcium, Zinc and Iodine are more critical<sup>6</sup>. Their daily requirement are given in table.

**Table. Recommended Dietary Intakes (Per day)\*.**

|   | Addition<br>for pregnancy | Non-<br>pregnant women | Total |
|---|---------------------------|------------------------|-------|
| Protein (g)                             | +6                        | 54                     | 60    |
| Folate ( $\mu\text{g}$ total<br>folate) | +200                      | 200                    | 400   |
| Iron (mg)                               | 1                         | 12                     | 13    |
| Calcium(mg)                             | +700                      | +500                   | 1200  |
| Zinc (mg)                               | +4.5                      | 15                     | 19.5  |
| Iodine ( $\mu\text{g}$ )                | +30                       | 120                    | 150   |

\* UK figures where available. Folate, zinc and iodine are Australian.

Folate is the only vitamin and calcium the only nutrient element whose requirement double in pregnancy<sup>6,12</sup>. Recently a possible relationship between folate deficiency and neural tube defect has been highlighted.<sup>12</sup> Liver and kidneys, whole grain, cereals, nuts and legumes are good sources of folate where as fruits are fairly poor (about 5 ug/100g). The folate content of vegetables varies from 10ug/100mg in potatoes and carrots, upto 300 ugm in enolive, the vitamin is largely destroyed by prolonged boiling<sup>6</sup>. The needs for iron are increased considerably (300 mg for fetus, 50 for placenta and 200mg for average post partum loss). Against these extra needs there is the saving from no menstruation (about 200mg) and improved intestinal absorption<sup>6</sup>. Calcium absorption is increased. Extra calcium needed for pregnancy and lactation can be supplied from milk 0.5 litre supplies 600mg cal<sup>6</sup>. Recommended intake of vitamin D is 400 I.U. (10mg) daily. Plasma Zinc falls by 30% in pregnancy due to hemodilution, hair zinc con. centration may also decline.<sup>6</sup> In areas where goitre is endemic there is a risk of cretinism so expectant mothers should be given an injection of iodized oil preferably before conception. The range of weight gain from before conception to shortly before delivery is considerably wide 6 — 24kg. An average of 12.5Kg is regarded as physiologically normal weight gain.<sup>13</sup> In developing countries like Pakistan and India weight gain reported is 7 and 6kg respectively.<sup>14,15</sup> Anaemia is common (54.7 -63.8%) and is mainly of iron and folic acid deficiency.<sup>16,17</sup> Serum Ferritin deficiency is present in 38% of pregnant mothers in Karachi.<sup>18</sup> The dietary factors of interest appears to be total energy intake in under-nourished, calcium<sup>19</sup> and vitamins iron and folic acid.

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