Maternal Nutrition Programming in the context of the 2016 WHO Antenatal Care Guidelines:

For a positive pregnancy experience

April 2018 www.mcsprogram.org

Background

Adequate maternal nutrition during the "first 1,000 days" window is especially critical throughout a woman's pregnancy through to the child's second birthday. Improving nutritional status of the woman before and during pregnancy can reduce the risk of adverse birth outcomes, such as low birthweight and pre-term birth (Black et al. 2008; Haddad et al. 2015; Shrimpton 2012; Black et al. 2013). Targeted approaches to address maternal nutrition and appropriate weight gain during pregnancy are essential to improve maternal, infant and child nutritional status, as well as associated health and nutrition outcomes.

This brief operationalizes the revised World Health Organization's (WHO) 2016 antenatal care (ANC) recommendations, providing guidance on how programs can plan and implement nutrition and anemia interventions for pregnant women. Specifically, this brief is for program implementers, district- and health facility-level program managers, and policy makers. This brief addresses the following key messages:

- Pregnancy requires a healthy diet that includes an appropriate intake of energy, protein, vitamins, and minerals to meet maternal and fetal needs.
- However, for many pregnant women, dietary intake of vegetables, meat, dairy products, and fruit is often insufficient to meet these needs, particularly in low- and middle-income countries (LMICs) where multiple nutritional deficiencies often co-exist.
- Obesity and overweight are also associated with poor health, pregnancy, and lactation outcomes. Women who are overweight or obese are less likely to initiate breastfeeding, exclusively breastfeed, and more likely to breastfeed for shorter duration (Soltani 2016; Garcia et al 2016; Anstey & Jevitt 2011; Babedure et al. 2015; Amir & Donath 2017). Many women in a variety of settings gain excessive weight during pregnancy, therefore pregnancy weight gain goals should be based on a woman's body mass index (BMI) at the start of her pregnancy.

- Anemia is estimated to affect 38.2% of pregnant women globally, with the highest prevalence in South-East Asia (48.7%) and Africa (46.3%). Anemia has several causes, including iron, folic acid, vitamin B12, and vitamin A deficiencies. Other causes of anemia in pregnancy include: increased nutrient needs during pregnancy to support fetal growth and development, malaria, helminth infections, other infectious diseases (i.e. tuberculosis), bacterial or viral infections, HIV/AIDs, and genetic blood diseases (i.e. sickle cell disease, trait, thalassemia etc.).

- Although most nutrition programs target infants and young children, a shift is needed to also address the health and nutrition of women pre-conception during pregnancy and lactation in the design of future programs (Victora et al. 2012).

- Improving diet during pre-conception and for adolescent girls is a crucial component of achieving optimal nutritional status during adolescence, pregnancy, and lactation through the identification and use of platforms to reach adolescents (i.e. schools, teen clubs) (Duffy et al. 2015).

- Provision of timely high-impact evidence-based antenatal care best practices improves health outcomes for mothers and newborns (WHO 2016). ANC is an important window for influence or intervention, since most pregnant women will seek ANC care at some point in their pregnancies. ANC is an opportune time to identify women with an "unhealthy" dietary pattern in early pregnancy (McGowan & McAuliffe 2012).

Overview of the WHO ANC Guidelines Nutritional Recommendations

The following are the highlights of the new WHO ANC guidelines nutritional recommendations:

Daily oral iron and folic acid (IFA supplements) with 30 to 60 mg of elemental iron and 400 µg (0.4 mg) of folic acid

- In settings with high prevalence of anemia in pregnant women ($\geq$ 40% pregnant women have blood Hb concentration < 110 g/L), daily dose of 60 mg of elemental iron preferred over lower dose.

- Anemia treatment: 120 mg elemental iron and 0.4 mg folic acid daily until Hb increases to 110 g/L or higher.

- In community settings with poor access to health-care professionals, consider task shifting[1] to reach the most vulnerable populations and ensure timely and continuous timely and consistent treatment of patients.

Provide counseling about healthy eating and keeping physically active to stay healthy and prevent excessive weight gain during pregnancy

- Discuss locally held beliefs, attitudes, and misperceptions on physical activity and foods considered healthy or appropriate for consumption during pregnancy.

- Provide recommendations on culturally appropriate healthy eating interventions, based on the local context (i.e. ANC nutritional counseling).

- Effective communication with pregnant women about healthy eating (including food sources of vitamins, minerals, and dietary diversity) is integral to preventing anemia.

- Consider task shifting for nutrition counselling.

[1] According to WHO, task-shifting is the redistribution of tasks among health workers (WHO 2008)

In undernourished[2] populations:

- **Nutrition education on increasing daily energy and protein intake** is recommended for pregnant women to reduce the risk of low-birth-weight neonates.
- **Balanced energy and protein dietary supplementation** is recommended for pregnant women to reduce the risk of stillbirths and small-for-gestational-age neonates.
- Mid upper arm circumference (MUAC) can identity protein-energy malnutrition
- Consider alternative delivery platforms (e.g. peer counselors, media reminders, etc.)

Preventive measures: Anti-helminthic treatment

- In endemic areas, preventive anti-helminthic treatment is recommended for pregnant women after the 1st trimester as part of worm infection reduction programs.

Health system interventions to improve ANC utilization and quality

- A minimum of eight ANC contacts are recommended to reduce perinatal mortality and improve women's experience of care.
- It is recommended that each pregnant woman carry her own case notes[3] during pregnancy to improve continuity, quality of care, and her pregnancy experience.
- Task shifting the promotion of health and nutrition related behaviors for maternal and newborn health, including counseling on exclusive breastfeeding, to a broad range of cadres, including lay health workers, auxiliary nurses, nurses, midwives, and doctors is recommended.
- Task shifting the distribution of recommended nutritional supplements and intermittent preventative treatment in pregnancy (IPTp) for malaria prevention to a broad range of cadres, including auxiliary nurses, nurses, midwives, and doctors is recommended.

Address Barriers to Adequate Maternal Dietary Intake

Many barriers impede adequate dietary intake in pregnant and lactating women. Food intake during pregnancy and lactation is largely driven by personal preferences and cravings, cultural beliefs, food taboos (i.e. prohibition against consuming certain foods), beliefs surrounding pregnancy physiology, as well as economic constraints (Kavle & Landy 2017). Examples include misperceptions related to knowledge of quantity of food to eat during pregnancy, amount of weight to gain during pregnancy, and "eating down" during pregnancy for fear of delivering a large baby. Moreover, drivers of food choice were influenced by food aversions, economic constraints, and household food availability. Evidence also reveals that counselling on maternal diet and weight gain during pregnancy was seldom carried out, and programming to support healthy maternal diet and gestational weight gain during pregnancy is scant (Kavle & Landy 2017). Tailored, culturally resonant nutrition education and counselling on diet and weight gain during pregnancy and lactation as well as monitoring of progress in maternal nutrition are areas of needed attention.

Monitoring of maternal dietary intake (i.e., diversity and frequency) is needed to track improvements in maternal nutrition in health programs (Victora et al., 2012), such as through the Minimum Dietary Diversity for Women, which measures whether women 15-49 years of age have consumed at least five out of ten food groups (FAO & FHI 360 2016).

[2] Undernutrition is classified as: BMI <18.5 (defined as 20–39% underweight prevalence is "high"; ≥ 40% underweight prevalence "very high")
[3] Home-based records

Strengthen Behavior Change and Counselling

Counselling and other social and behavior change interventions are critical. These interventions should include context-specific, culturally resonant discussions with women and key influencers – such as engagement with elder women and fathers – on the "what and why" of foods to consume that provide the necessary energy, protein, micronutrients, and fatty acids, including fortified staple foods and condiments (Kavle & Landry 2017). These interventions should address cultural taboos and perceptions, which can limit food intake, in order to provide feasible solutions to increase dietary intake (USAID 2015).

Social and behavior change interventions to improve maternal nutrition—including maternal diet counselling—can also be integrated into community-level activities, such as home visits carried out by community-level health workers, or engaging elder women and fathers through mother-to-mother or community support groups (Kavle & Landry 2017).

Another potential platform for integrating maternal nutrition interventions and facilitating behavior change is through care groups, which consist of volunteer, community-based health educators who visit 10-15 neighbors to share information and negotiate for improved behaviors on various health topics (Kavle & Landry 2017). This community-based model may provide an opportunity to discuss improvements in maternal diet with mothers, their families, and other key influencers.

The 2016 WHO ANC guidelines call for a minimum of eight ANC contacts, which can be adapted to the individual country context and may include a combination of facility- and community-level ANC contacts. Health programs should maximize ANC platforms to take advantage of every contact with pregnant women to strengthen the quality of counselling provided on maternal nutrition and weight gain during pregnancy. Improving the quality of nutrition counseling by ANC providers can be incorporated into overall capacity-building strategies for counseling delivered during ANC contacts.

Table 1: ANC Contact Schedule – WHO ANC Guidelines

ANC Contact Schedule and Proposed Time for Nutrition interventions and IFA supplementation		Nutrition-related Interventions and Considerations during ANC Contacts
To be adapted to country context, based on local disease burden, health and nutrition needs of pregnant adolescents and women		
Contact 1 or more: Up to 12 weeks	Administer daily 30 to 60 mg of elemental iron and 400 µg (0.4 mg) of folic (IFA) Food insecure regions: Increase daily dietary energy and protein and provide energy/protein supplementation	• Take diet history and counsel on healthy diet consisting of a variety of foods, including green and orange vegetables, meat, fish, beans, nuts, whole grains, oils and fruits • Measure and record weight; Mid upper Arm Circumference (MUAC) to identify undernutrition • Counsel women on healthy weight gain in pregnancy based at the start of pregnancy • Address needs of women identified with undernutrition, and overweight, and obesity at any time in pregnancy, including communities in food-insecure and emergency settings • Counsel on anemia and the need to consume iron rich foods • Counsel regarding why, when, how many, and how long to take IFA. Refer to example: Kenya Ministry of Health National IFA counselling cards. • Discuss IFA side effects and counsel regarding how to manage side effects, if they occur and when to return for follow-up

<table>
<tr><th colspan="2">ANC Contact Schedule and Proposed Time for Nutrition interventions and IFA supplementation</th><th>Nutrition-related Interventions and Considerations during ANC Contacts</th></tr>
<tr><td colspan="2"></td><td>Counsel on food taboos and cultural beliefs
Address individual barriers that may make it difficult for women to maintain a healthy diet during pregnancy.
Counsel on hygiene and sanitation
Counsel on sleeping under ITNs and administration of IPTp-SP (for pregnant women living in all areas with moderate to high malaria transmission regions). Refer to MCSP Controlling Maternal Anemia and Malaria brief.
In undernourished and food insecure populations:
Balanced energy and protein dietary supplementation is recommended for pregnant women to reduce the risk of stillbirths and small-for-gestational-age neonates.
Consider distribution of energy-protein supplements in food insecure areas or areas without access to variety of foods
Nutrition education on increasing daily energy and protein intake is recommended for pregnant women to reduce the risk of low-birth-weight neonates</td></tr>
<tr><td>Additional contacts: can be made by task-shifting to lay counselors, community health workers, etc.</td><td>Continue to administer daily 30 to 60 mg of elemental iron and 400 µg (0.4 mg) of folic (IFA)</td><td rowspan="8">In addition to the first contacts above, remember to:
Monitor weight gain:
Insufficient weight gain: counsel on increased dietary intake and refer for therapeutic treatment if moderately or severely malnourished
Excessive weight gain: counsel on diet and risks associated with overweight and obesity
Counsel on why, when, how many, and how long to take IFA
Discuss side effects of IFA and counsel on how to manage side effects, if they occur and when to return for follow-up
Counsel on exclusive breastfeeding in the first six months of life and maternal nutrition required for additional caloric expenditure</td></tr>
<tr><td>Contact 2: 20 weeks</td><td rowspan="7">Continue to administer daily 30 to 60 mg of elemental iron and 400 µg (0.4 mg) of folic (IFA)</td></tr>
<tr><td>Contact 3: 26 weeks</td></tr>
<tr><td>Contact 4: 30 weeks</td></tr>
<tr><td>Contact 5: 34 weeks</td></tr>
<tr><td>Contact 6: 36 weeks</td></tr>
<tr><td>Contact 7: 38 weeks</td></tr>
<tr><td>Contact 8: 40 weeks</td></tr>
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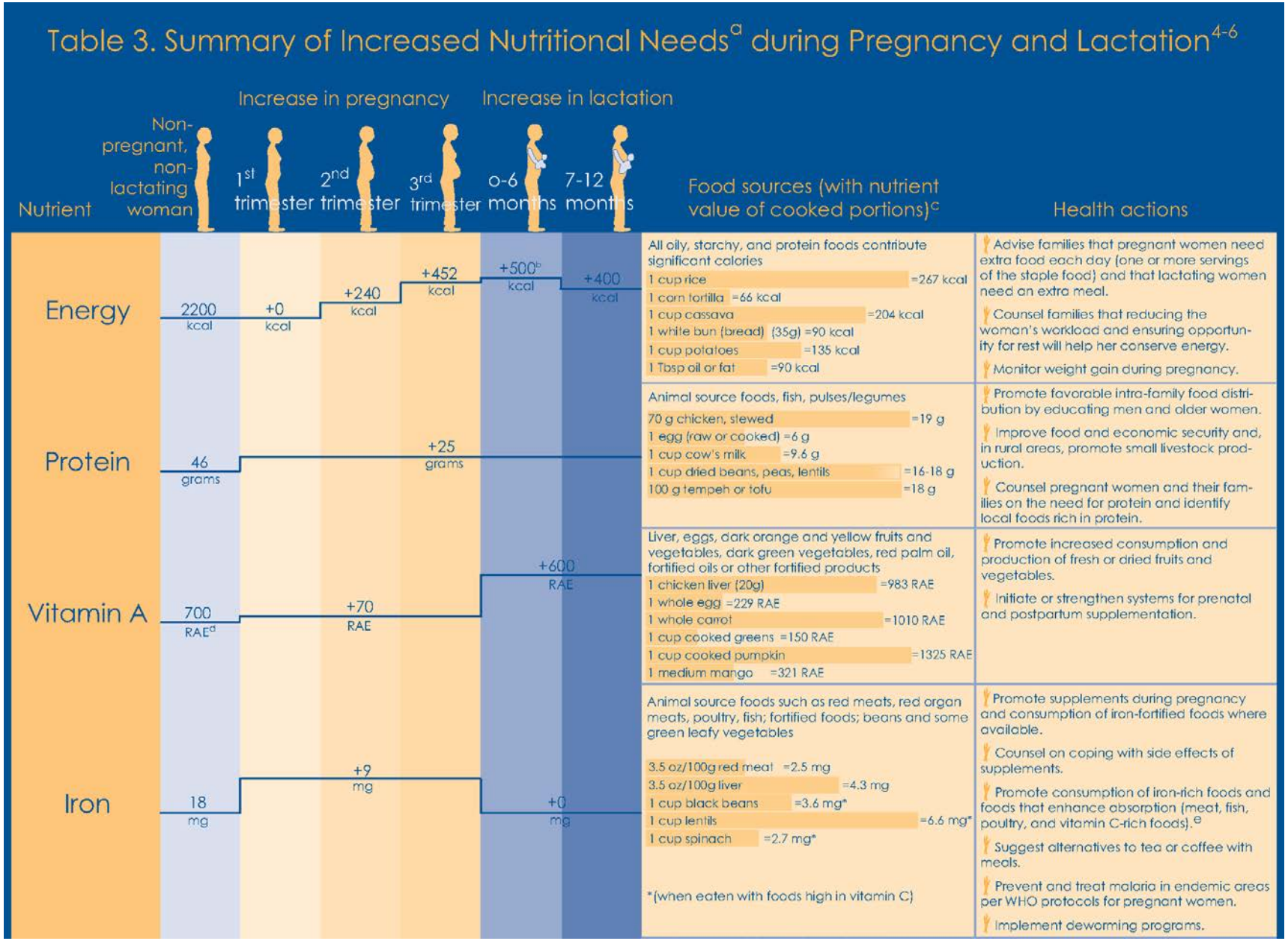
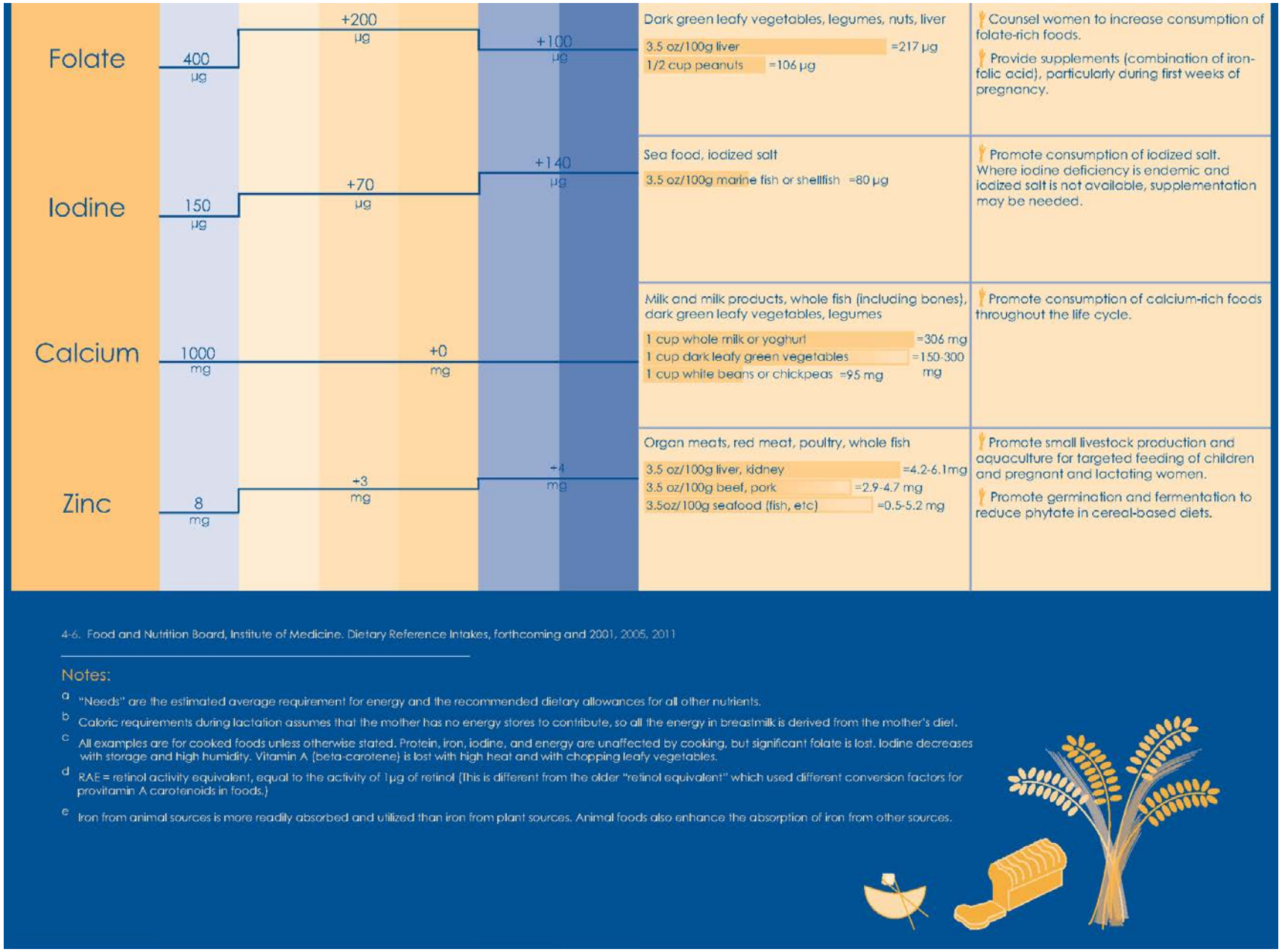
Table 2: Key Messages

Sustain routine nutrition counseling	ANC tools and job aids	Cultural considerations
Integrate into routine ANC nutrition education and counseling during pregnancy and lactation Incorporate the use of diet plans into birth preparedness plans and ANC counseling Integrate into routine ANC, monitoring for optimal weight gain during pregnancy and lactation Create nutrition corners during ANC for group counseling and food/cooking demonstrations where feasible Strengthen ANC providers' communication and counseling skills to take a diet history and address barriers to a healthy diet, including economic constraints and misperceptions and cultural beliefs around maternal nutrition Integrate nutrition counseling and support into the routine system and continuum of care from ANC through delivery and expanded postnatal period	Examples include: Standards on Nutritional Assessment, Counseling and Support for pregnant and lactating women Dietary guidelines for pregnant and lactating women District/local specific food consumption patterns information. Use trials of improved practices (TIPS)/ other formative assessment tools) Dietary assessment and diet history tools Nutrition care and support plans Nutrition counseling package Food group chart Specialized food supplementation chart (entry, transition and exit) Take home brochures/leaflets	Conduct a formative assessment to ascertain local knowledge and beliefs of/around diet during pregnancy and lactation. Perceptions to be addressed include: • Foods considered healthy and/or appropriate for pregnancy and lactating women including food preferences and cravings • Eating down: fear of having a big baby causing difficult labor and belief that certain foods cause difficult pregnancy experience • Beliefs that pregnant women are already full so they do not need much food • Beliefs of ill effects during labor and delivery caused by consumption of certain foods • Consumption of diets high in cereals and carbohydrate and, to a lesser extent, vitamin A-rich fruits, vegetables, nuts/pulses and fats/oils. • Food restrictions during confinement period – immediately after delivery • Beliefs that food makes the lactating mother ill during the early stages of lactation

Table 3: Summary of Increased Nutritional Needs during Pregnancy and Lactation





4-6. Food and Nutrition Board, Institute of Medicine. Dietary Reference Intakes, forthcoming and 2001, 2005, 2011

Notes:

a "Needs" are the estimated average requirement for energy and the recommended dietary allowances for all other nutrients.

b Caloric requirements during lactation assumes that the mother has no energy stores to contribute, so all the energy in breastmilk is derived from the mother's diet.

c All examples are for cooked foods unless otherwise stated. Protein, iron, iodine, and energy are unaffected by cooking, but significant folate is lost. Iodine decreases with storage and high humidity. Vitamin A (beta-carotene) is lost with high heat and with chopping leafy vegetables.

d RAE = retinol activity equivalent, equal to the activity of 1µg of retinol (This is different from the older "retinol equivalent" which used different conversion factors for provitamin A carotenoids in foods.)

e Iron from animal sources is more readily absorbed and utilized than iron from plant sources. Animal foods also enhance the absorption of iron from other sources.

Selected Resources

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This report is made possible by the generous support of the American people through the United States Agency for International Development (USAID) under the terms of the Cooperative Agreement AID-OAA-A-14-00028. The contents are the responsibility of the Maternal and Child Survival Program and do not necessarily reflect the views of USAID or the United States Government.