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Beliefs and Practices About Food During Pregnancy

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Implications for Maternal Nutrition

As in many other countries, there are traditional beliefs in India regarding specific food items a pregnant woman should or should not eat during pregnancy and about the proper amount of food desirable for a pregnant woman for successful reproductive outcome.

This paper reviews the evidence available from community or hospital studies regarding these beliefs as well as the reasons reported for these beliefs and the extent to which these are reflected in their food behavior. Programmatic implications of the findings are discussed.

All societies have traditional beliefs regarding harmful and beneficial foods for women during, pregnancy. There are also beliefs regarding the optimal amount of food to be taken during pregnancy for a successful reproductive outcome. These beliefs may or may not conform to the modem biomedical notions about the proper types and amount of food needed by pregnant women to safeguard maternal nutrition, adequate growth of foetus and safe delivery. Many studies have shown that the food taken by a large section of pregnant women in India is deficient in caloric content, protein and other nutrient-a leading cause of maternal and child mortality.

Three well-known reasons for low nutritional status of pregnant women in India are (i) widespread poverty, (ii) discrimination against women and female children in household food distribution and health care, and (iii) lack or poor quality of antenatal care. Whether or not the beliefs and practices regarding food during pregnancy are significant additional reasons for the, low nutritional status of pregnant women and undesirable reproductive outcome in India is an important question which has been hardly addressed by scholars. Anthropologists and nutritionists have, conducted studies on various aspects of food beliefs and practices of pregnant women in Indian communities and hospitals; but most of these are limited by narrow disciplinary perspectives and have not discussed in any depth the possible effects of specific beliefs on the dietary behavior maternal nutrition and on reproductive outcome.

The present paper attempts to pull together information relevant to the above question from the available literature. The belief of 'eating down' - the belief that pregnant women should eat less than before pregnancy or should not increase the diet during pregnancy mainly to limit baby size and avoid a difficult delivery-is known to be common in India and many other countries [Brems and Berg 1989]. A critical issue in planning and delivering nutrition and health services that are nutritionally, obstetrically, and culturally appropriate for pregnant women is whether this belief has a significantly harmful effect on reproductive outcome in India and, if so, what should be and can be done about it.

This paper will review in two different sections the food items, which are believed to be harmful and beneficial in various Indian communities along with the reasons for these beliefs and the extent to which these are actually practiced. Since these beliefs are often associated with the concepts of 'hot' and 'cold' foods, an initial section will be devoted to the prevalence, and interpretations of these concepts in India. These will be followed by a section on pica foods or foods that are specially craved for by pregnant women and a section on the amount of food believed to be proper in various communities along with the reasons for the beliefs and the extent to which the beliefs are actually practiced. The final section will deal with the nutritional effects of the beliefs and their program implications.

'HOT' and 'COLD' Foods

The concepts of 'hot' and 'cold' foods are quite widespread in India and many other countries but the underlying criteria for classifying foods as 'hot' and cold' are often not clear. Although them seems to be some consensus regarding the classification of specific foods as 'hot' and 'cold' and the perceived consequences of taking them in a localized population, considerable variation exists in this respect not only between different countries but it also within a country and within its various regions. The studies in India reviewed for this paper indicate that in Indian communities food items perceived is 'hot' are often believed to be harmful for pregnant women and those perceived is 'cold,' believed to be beneficial, although in a few communities effects are believed vary in different stages of pregnancy and also on individual physical constitution. Moreover, a fairly common ethnophysiological theme in India is that a balance of 'hot' and 'cold' is necessary for body's well-being, and since pregnancy generates a state of 'hotness', it is desirable to bring a balance taking 'cold' foods Mathews and Benjamin; Niether and Niether 1989; Pool; Ramanamurthy. The diversity in food restrictions and prescriptions in different parts of India is often due to the variation in the classification of specific foods as 'hot' and 'cold' as shown in Table 1.

Table 1: Food Items Perceived as 'Hot' and 'Cold' by Study Respondents in Various Indian States

Food Item	States in Which Perceived as 'Hot'	States in Which Perceived as 'Cold'
Food grains and seeds		
Wheat	Andhra Pradesh [Jesudason and Shirur; Ramanamurthy], Karnataka [Nichter and Nichter], Uttar Pradesh [Jeffery et al]	Gujarat [Pool]
Rice	Karnantaka [Rao], Tamil Nadu [Mathews and Benjamin]	Gujarat [Pool], Uttar Pradesh [Jeffery et al]
Pulses	Gujarat [Pool], Karnataka [Rao], Uttar Pradesh [Jeffery et al]	
Millet		Gujarat [Pool], Uttar Pradesh [Jeffery et al]
Gram (green)	Karnataka [Rao]	Karnataka [Nichter and Nichter], Tamil Nadu [Ramanamurthy]
Gram (red)	Andhra Pradesh [Jesudason and Shirur]	
Horsegram	Tamil Nadu [Ferro-Luzzi; Ramamurthy]	
Cowgram	Tamil Nadu [Mathews and Benjamin]	
Maize		Tamil Nadu [Ramanamurthy]
Sesame seeds	Gujarat [Pool], Karnataka [Khanum and Umapathy; Rao], Tamil Nadu [Dumont; Ferro-Luzzi; Ramamurthy	
Animal Foods		
Meat	Gujarat [Pool], Karnataka [Rao], Uttar Pradesh [Jeffery et al], Tamil Nadu [Ferro-Luzzi]	
Egg	Andhra Pradesh [Jesudason and Shirur], Gujarat [Pool], Karnataka [Rao], Uttar Pradesh [Jeffery et al]	
Fish	Gujarat [Pool]	
Fish (dried)	Andhra Pradesh [Jesudason and Shirur], Gujarat [Pool], Tamil Nadu [Ferro-Luzzi; Mathews and Benjamin]	
Milk and Milk Products		

Milk		Karnataka [Rao]	Gujarat [Pool], Uttar Pradesh [Jeffery et al], Tamil Nadu [Ferro-Luzzi]
Yoghurt		Karnataka [Rao]	Gujarat [Pool], Tamil Nadu [Djurfeld and Lindberg]
Buttermilk		Karnataka [Rao]	Gujarat [Pool]
Clarified butter (ghee)		Uttar Pradesh [Jeffery et al]	
Vegetables			
Most vegetables			Gujarat [Pool]
Eggplant		Gujarat [Pool], Karnataka [Rao], Tamil Nadu [Mathews and Benjamin]	Tamil Nadu [Ramamurthy]
Bottlegourd		Andhra Pradesh [Jesudason and Shirur], Tamil Nadu [Ramamurthy]	Tamil Nadu [Mathews and Benjamin]
Bittergourd		Karnataka [Nichter and Nichter]	
Ashgourd		Karnataka [Rao]	Tamil Nadu [Ferro-Luzzi]
Pumpkin		Karnataka [Nichter and Nichter]	Tamil Nadu [Mathews and Benjamin, Ramamurthy]
Beans		Tamil Nadu [Mathews and Benjamin]	
Peas			Tamil Nadu [Ramamurthy]
Carrot		Tamil Nadu [Ramamurthy]	
Radish		Tamil Nadu [Ramamurthy]	Tamil Nadu [Mathews and Benjamin]
Drumstick		Karnataka [Nichter and Nichter], Tamil Nadu [Ramamurthy]	
Tomato		Tamil Nadu [Mathews and Benjamin, Ramanamurthy]	
Potato		Tamil Nadu [Ramamurthy]	
Sweet potato			Tamil Nadu [Mathews and Benjamin]
Bamboo shoots	Karnataka [Nichter and Nichter]		
Fruits and Fruits Products			
Most Fruits			Gujarat [Pool], Karnataka [Nichter and Nichter, Rao], Uttar Pradesh [Jeffery et al]
Unripe fruits	Karnataka [Nichter and Nichter]		
Banana	Andhra Pradesh [Jesudason, Rao], Karnataka [Rao]		Gujarat [Pool], Tamil Nadu [Ramamurthy]
Coconut			Andhra Pradesh [Jesudason and Shirur], Tamil Nadu [Mathews and Benjamin]
Coconut water			Karnataka [Nichter and

		Nichter], Tamil Nadu [Ferro-Luzzi]
Papaya	Andhra Pradesh [Jesudason and Shirur], Gujarat [Pool], Karnataka [Nichter and Nichter], Tamil Nadu [Ferro-Luzzi]	
Pineapple	Karnataka [Nichter and Nichter], Tamil Nadu [Ferro-Luzzi]	
Mango	Andhra Pradesh [Jesudason and Shirur], Tamil Nadu [Ferro-Luzzi]	
Groundnut	Tamil Nadu [Mathews and Benjamin]	Gujarat [Pool]
Palmyra fruit	Tamil Nadu [Mathews and Benjamin]	
Custard apple		Tamil Nadu [Ferro-Luzzi]
Dates	Gujarat [Pool], Tamil Nadu [Ramamurthy]	
Jaggery	Andhra Pradesh [Jesudason and Shirur], Gujarat [Pool], Uttar Pradesh [Jeffery et al]	
Sugar	Karnataka [Rao]	
Honey	Karnataka [Rao]	
Molasses	Uttar Pradesh [Jeffery et al]	
Spices and Herbs		
Most spices	Gujarat [Pool]	
Onion	Gujarat [Pool], Tamil Nadu [Ramamurthy]	
Garlic	Gujarat [Pool], Tamil Nadu [Ramamurthy]	
Ginger	Tamil Nadu [Ferro-Luzzi]	
Salt	Karnataka [Nichter and Nichter]	
Chillies	Gujarat [Pool], Tamil Nadu [Mathews and Benjamin]	
Cumin		Karnataka [Nichter and Nichter]
Fenugreek	Gujarat [Pool]	
Aniseed		Karnataka [Nichter and Nichter]
Amaranth	Andhra Pradesh [Jesudason and Shirur]	Karnataka [Nichter and Nichter]
Mustard	Tamil Nadu [Ferro-Luzzi]	
Coriander		Karnataka [Nichter and Nichter]
Beverages		
Alcohol	Andhra Pradesh [Jesudason and Shirur], Gujarat [Pool; SRRT]	
Coffee	Tamil Nadu [Ferro-Luzzi]	
Tea	Uttar Pradesh [Jeffery et al]	

Note: Names in parentheses are those of corresponding authors referred to in this paper.

There, is a striking uniformity in the perception of all animal foods (eggs, fish and meat) as hot. In some societies these are perceived as harmful not only because they are believed to make babies too large. Milk, yoghurt and buttermilk are perceived as 'cold' in Gujarat, Uttar Pradesh and Tamil Nadu communities but as 'hot' in a Karnataka community. In an Uttar Pradesh village clarified butter (ghee) is perceived as 'hot' (but not excessively so) and beneficial for pregnant women because it produces blood and gives strength.

Most fruits are perceived as 'cold' in Gujarat, Karnataka and Uttar Pradesh communities but significant exceptions exit. For example, in Karnataka community's banana, papaya, jackfruit pineapple and all unripe fruits are perceived as 'hot'. Fruits perceived as 'hot' in Tamil Nadu communities are more in number (papaya, pineapple, mango, jackfruit, groundnut and palmyra fruit) than those perceived as 'cold' (coconut and custard apple). In Andhra Pradesh communities' banana, papaya and mango are perceived as 'hot'; only fruit perceived as 'cold' is coconut. There seems to be some general consensus in perceiving papaya, pineapple and jackfruit as 'hot' and coconut as 'cold'. There also seems to be a consensus in perceiving jaggery as 'hot' but sugar is perceived as 'cold' in a Gujarat community and 'hot' in a Karnataka community.

Perceptions regarding 'hotness' and 'coldness' of vegetables vary more than those regarding fruits. Karnataka communities characterized a few vegetables as 'hot' (eggplant, bittergourd, ashgourd, pumpkin, drumstick and bamboo shoots) but none as 'cold'. In Tamil Nadu a few vegetables are perceived as 'hot' (eggplant, bottlegourd, beans, carrot, raddish, drumstick and potato) and a few as 'cold' (eggplant, bottlegourd, ashgourd, pumpkin, raddish, tomato and sweet potato). It may be noted that different communities in the same state may perceive the same vegetable as 'hot' and 'cold' (e.g. eggplant, bottlegourd, and radish in Tamil Nadu). Even in the same community perceptions between individuals may vary regarding specific food items.

Foodgrains form the staple diet for most people in India. Perceptions about the 'hotness' and 'coldness' of specific grains vary considerably indifferent regions. More sins are perceived as 'hot' than as 'cold'. For example, wheat is perceived in Andhra Pradesh, Karnataka, Uttar Pradesh and, Tamil Nadu communities as 'hot' and as 'cold' only in a Gujarat community. Pulses are perceived as 'hot' in a few communities (Gujarat, Karnataka and Uttar Pradesh). and 'cold' in none. Sesame seeds are perceived as 'hot' in Gujarat, Karnataka and Tamil Nadu and

'cold' in none. Varieties of grains are sometimes perceived differently in different communities, even in the same state.

Spices and herbs are perceived more commonly as 'hot' than 'cold'. For example, in a Gujarat community some spices (specially, onion, garlic, chilies and fenugreek) are perceived as 'hot' and none as 'cold'. In. Tamil Nadu communities ginger and mustard are perceived as 'hot' and none as 'cold'. In 'a Karnataka community, however, more spices are perceived as 'cold' (cumin, aniseed, amaranth and coriander) than as 'hot' (salt). There is very little information on beverages. Alcohol, tea and coffee have generally been mentioned as 'hot' in a few communities.

Wide variations regarding, perceptions of 'hotness, and 'coldness' in various Indian communities, as revealed in Table 1, indicate that the underlying reasons for perceiving specific food items as 'hot' or 'cold' vary considerably. Very few studies cited in this paper have attempted to analyze these reasons. It is, however, clear that the concepts of 'hot' and 'cold' foods generally bear no relation to their temperature or pungency. Also the foods characterized as 'hot' and cold' do not seem to possess any common characteristics such as color, texture and form. The most plausible explanation of categorizing some foods as 'hot' and some as 'cold' in most communities perhaps lies in the perceptions people have about the effects which specific foods have on the person who cats them.

Pool (1987) elaborates this relationship in his attempt to explain the classification of some foods as 'hot' and others as 'cold' by a mostly tribal community in Gujarat. In this community perceptions of the hot cold qualities of food seem to be derived from the disease which is thought to result from eating too much of the food in question. For example, eggplant is perceived as 'hot' because of the belief, perhaps based on some experience that if a person eats too much of it, he/she will get a skin disease (which is 'hot'); bananas are cold because too many bananas cause coughs acid colds (which are 'cold' diseases). All diseases are not categorized as either 'hot' or 'cold' but there was a surprising unanimity among 48 informants in the way they identified 10 diseases as 'hot' and eight as 'cold'. Thus, all skin diseases (common in the community) which are supposed to include scabies, boils, ulcers, measles, chickenpox, smallpox, are thought to be caused by excessive heat in the body. The sources of this heat may be 'hot' food, environmental heat, and lack of hygiene or 'unclean blood'. Respiratory diseases, which include coughs, colds, asthma, bronchopneumonia and breathlessness, are perceived as 'cold' diseases caused by excessive cold food or cold weather. Pregnancy and menstruation are considered to be 'hot' stages in which a woman is vulnerable to hot food and hot weather, and particularly prone to hot diseases. It is considered desirable to the amount of heat in the body stem to different

levels during the, various stages of pregnancy. In the early stage when the body is believed to be in heated state, women are advised to take more 'cold' food in order to avoid abortion and 'hot' diseases. In the third trimester women are supposed to need 'enough heat expel the infant' and so should take more 'hot' food.

Foods Believed To Be Harmful

Table 2 summarizes information available from 14 studies, which investigated food items believed to be harmful. It includes reasons for the beliefs and the extent to which the beliefs were reflected in actual behavior. The population's studies are in the table in alphabetical order of the states to which they belong. Most of the groups studied are rural communities. One of them (No5) to consists of 500 mothers who attended hospital and clinics in Mysore. The largest sample of women surveyed (1200, No 13) is drawn from all districts of Tamil Nadu Ferro-Luzzi. The next largest is a sample of 1,106 pregnant, lactating and weaning women from 44 villages of Mahabubnagar district of Andhra Pradesh Jesudason and Shirur. These are the only two groups for which some quantitative estimates of the proportions of women who actually avoided specific food items are available. For the Andhra Pradesh study estimates of the proportions of women who believed specific foods as harmful are also available. Locality is not known for one of the studies cited (No 14). The beliefs and practices for different categories of food are discussed below.

Table: 2 Food Items Believed to be Harmful During Pregnancy

Respondents, Year of Study, Loe, Source	Food Items Believed Harmful	Reasons for Belief	Practice	Comments
(1) 1106 Pregnant, lactating and weaning women; 1970s; 44 villages of Mahabubnagar district, Andhra Pradesh [Jesudason and Shirur 1980]	Papaya (72 per cent) Pumpkin 55 per cent) Buffalo milk (20 per cent) Banana (20 per cent) Egg (6 per cent), Chicken (11 per cent) Amaranth, bottlegourd, eggplant, pulses, toddy (earn less than 1 per cent)	'Hot' 'Hot', bad for baby and mother, boils, diarrhroea Not available 'Hot', 'cold' fever, cough, bad for baby 'Hot', bad for baby Various reasons	2 per cent avoided 5 per cent avoided Avoided by none 3 per cent avoided 2 per cent avoided each Avoided by few	Papaya, pumpkin, buffalo, milk, banana, egg and chicken were items reported by women by women as their favorite; perhaps a reason why to their belief
(2) 50 women; 26 Hindu castes; 1960-61; Telengana	Raw egg, papaya, horsegram; dolichos biflorus)	Induce abortion Conclusion in baby Deformed baby or	Not available	

region, Andhra Pradesh [Mahadevan 1961]	BananaTwin fruits Goat's mix (in summer) Combination of fish and milk	twin Hot Not available		
(3) 30 women and 30 men; mostly Bhil tribe, 1982-83; Bharuch district, Gujarat [Pool 1987]	In first trimester all items believed to be 'hot': sesame seeds, papaya, eggplant, dried, fish, onion, garlic, chillies, jaggery, toddy, most pulses, dates, fenugreek, egg, meat, spices. In third trimester all items believed to be 'cold'; yoghurt, buzer milk, wheat, most fruits, most vegetables, all left- overs	'Hot', ratevo (manigested in abortion, stillbirth, rashes, red spots or blotches on skin of baby), exacerbate already heated state in early pregnancy 'Cold', formation of a sticky white layer of 'fat' around foetus which makes it stuck in womb	Not available	
(4) 33 pregnant women in 16 villages; 1991-92; Bharuch district, Gujarat [SRRT 1992]	Yoghurt, milk, banana, left-overs Fish, meat, egg, toddy Oil, spices, salt, meat, fish Oil, milk, yoghurt, buttermilk, groundnut Green coconut, dates	'Cold', 'sour' too much pain during labor 'Hot', induces abortion Causes ratevo (rashes on skin of mother and baby) Chonte food, difficult delivery, baby sticks to womb Interferes development and delivery of placenta and umbilical cord	Adherence to belief quite irrelevant for relatively poor women because they rarely take, the proscribed foods in their non-pregnant condition; beliefs affect better-off women	Green coconuts and dates mentioned only by traditional birth attendants
(5) 500 mothers in Mysore hospitals and clinics; 77 per cent Hindu; 1975-76, Karnataka [Khanum and Umapathy 1976]	Papaya Sesame seeds Egg, jambu fruits (syzygium cumini)	'Hot' induces abortion 'Hot' induce abortion Red and blue patches on baby's face and body	35 per cent avoided 16 per cent avoided 19 per cent avoided egg and 17 per cent avoided jambu fruit	Avoided more by illiterate women

(6) 282 mothers with young children; mid-1980s; two taluks of Karnataka [Nichter and Nichter 1989]	Papaya, pineapple, unripe fruits, pumpkin, wheat bittergourd, drumstick, bamboo shoots, salt Jackfruit and unctuous vegetables (eg. Eggplant, spinach, drumstick), some fishes (eg. Indian mackerel, prawn, shellfish, crab), blackgram, beaten rice, Sweet potato, jackfruit, bengalgram, pulses	'Overheating' of body manifested in burning sensation during urination, scantly urine, white, discharge: induce abortion and premature delivery Excessive toxicity (nanju) resulting in blood impurity, wound infections, morning sickness of mother, skin infection of baby Gaseous (vayu) foods, cramp the living space of foetus and restrict its movement	Consumption of foods classified as 'heating' are decreased if not restricted	
(7) 68 pregnant women; majority Hindu, rest Muslim; early 1980s; three villages in Dharwad district, Karnataka [Rao 1985]	Jack fruit Sweet potato Colostrum of cow and buffalo Papaya Groudnuts and coconut Melon and cucumber Fried foods Chilies, tamarind, overspiced and sour foods Ashgourd (Benimeassa hispida), banana, eggplant Sesame seeds Guava Stale, cold foods	'Hot', causes sepsis Produces gas 'Hot', indigestible Induces abortion 'Hot' cause giddiness, vomiting 'Cold' 'Heavy' indigestible, vomiting Indigestion and heartburn 'Hot' Bleeding and abortion Stomach-ache, colds Unappetizing and indigestible	Some fruits (eg. Jackfruit, guava, melon, cucumber) available only in season and hence not important in daily diet	All respondents except three who refused to participate gave similar reasons; groundnuts, coconut and cucumber are commonly eaten items
(8) A few women interviewed in-depth, anthropological study; 1982-83, 1985:2 villages in Bijhor district, Uttar Pradesh [Jeffery et al 1989]	Meat egg, fish, pulses, wheat, garlic, onion, tea, hot milk, molasses, most spices, most nuts, beans, potato, warm water Rice	Hot induce abortion, uterine contractions 'Heavy' food (badi), causes flatulence	Only few informants reported any change in diet during pregnancy; some stopped eating foods unpalatable to them (potato, onion, fish,, hot spices); meat, egg, fish consumption	Some women not aware of any restriction on food during pregnancy

			insignificant also among non-pregnant women	
(9) A few women of Kallar caste interviewed in depth; anthropological study 1949-50; I village in Tamil Nadu [Dumont 1957]	Millet (tinai), sesame seeds, pineapple	Induce abortion	Pineapple rarely available	
(10) A few women interviewed indepth; 1969-72; 1 village in Tamil Nadu [Djuefeldt and Lindberg 1975]	Yoghurt, buttermilk, cold rice in water in earthern pot	'Cold', disturb balance of cold and heat in delicate pregnant body		
(11) 3850 women; 1975-76; 5 areas of 3 blocks in North Arcot district, Tamil Nadu [Mathews and Benjamin 1979]	Pulses, meat, sweets, Kali	Not available	Avoided by 5 to 16 percent different areas	
(12) 48 pregnant women; all scheduled castes; early 1970s; 1 village near Vellore city in Tamil Nadu [Sundararaj and Periera 1973]	Jambu fruit Fruit and root of palmyra (borassus flabellifer) Gingelly seeds, papaya	Blisters in newborn Obstruct growth of foetus Induce abortion		
(13) 1200 women; mostly Hindu, rest tribal, Muslim and Christian; early 1970s; all districts of Tamil Nadu[Ferro-Luzzi 1980]	Meat (pork, chicken) Fish (incl crabs, shark catfish) Eggs Buttermilk, yoghurt, buffalo milk Papaya Pineapple Mango, Jackfruit Custard apple, coconut milk Palmyra fruit Banana Double Banana Jambu fruit Sesame seeds Millet (time, setaria italica) Horsegram Wheat, mustard seeds, jaggery, honey Ashgourd, bottlegourd,	'Hot', induce abortion and vomiting, skin disease, deformity, 'impure' baby too big (if taken after 7th month) 'Hot', induce abortion, nausea Baby too big, other disease, pain on baby Baby too big, difficult to digest 'Hot', induce abortion, uterine hemorrhage,	6 per cent of 1059 meat-eater avoided during pregnancy 7 per cent of fisheaters avoided 9 percent of egg eaters avoided 3 per cent of 1200 avoided 82 per cent of 1200 avoided 95 percent avoided in Madurai	Although avoidances are described in the paper with elaborated details. most food items are actually avoided by small proportions of women; considerable variation between ethnic groups and districts; author attempts

	eggplant	diarrhea 'Hot', induce abortion 'Hot', induce abortion, fits in baby 'Cold' Sickness, particularly asphyxia Digestive trouble Birth to twin Baby dark-skinned, venereal diseases, abortion 'Hot', induces abortion, hemorrhage. Hot', induces abortion 'Cold' pain, headache	district but only 6 per cent in Kanyakumari district Not available Not available A few women believed it might be eaten if craved for; 75 per cent of 1111 avoided In some districts 65-90 per cent avoided 26.3 per cent of horsegram-eaters avoided Sporadically mentioned Sporadically mentioned	psychological
(14) 302 pregnant women; rural but locally not specified [Sood and Kapil 1984]	Jaggery, Sugar, nuts Beans, Maize, Buttermilk, orange, yoghurt	'Cold', pain, headache 'Hot', induce abortion 'Cold', harm foetus	Sporadically mentioned Not available	

Note: Figures in parentheses represent the percentages of respondents who believed the item to be harmful.

According to the findings of studies reviewed for this paper, restrictions during pregnancy in India seem to be more prevalent for any other food category. The fruit that is most widely believed to be harmful in India is papaya. Next in order of their reported harmfulness are banana, jackfruit and pineapple. Other fruits, which are mentioned as undesirable during pregnancy in one or more studies are coconut, custard apple, dates, groundnuts, guava, jambu fruit, mango, melon, nuts and palmyra fruits. Twin bananas are believed to be undesirable for pregnant women in Andhra Pradesh and Tamil Nadu for the fear of giving birth to twins. Among the Bhil women of Gujarat most fruits are believed to be harmful for pregnant women in the third semester of pregnancy because the fruits are believed 'to be 'cold', causing a sticky layer of 'fat' formed around the foetus making it stuck to the womb (Pool 1987). Fruit products such as honey jaggery, molasses and sugar are believed to be harmful in some communities but for different reasons.

Papaya is reported to be harmful for pregnant, women in both the studies of Andhra Pradesh communities, all three studies of Karnataka communities, two studies in Tamil Nadu and one study in Gujarat. In sample surveys conducted in Andhra Pradesh and Kerala in 1971 (not cited in Table 2), 22 per cent of women in Andhra Pradesh and 23 per cent in Kerala stated that papaya should not be taken during pregnancy. In both the states the belief regarding harmfulness of papaya was more common among the upper income group than among the lower income group ORG.

The most common reason given for avoiding papaya during pregnancy is its quality of being 'hot' and inducing abortion. Other reasons, also perhaps associated with 'hotness', include causation of uterine hemorrhage, white discharge from vagina and diarrhea. Behavioral evidence of the belief regarding harmfulness of papaya, a widely available multi-seasonal fruit in India is not adequate. In rural areas of Mahabubnagar of Andhra Pradesh, 72 percent of 1,106 women interviewed reported papaya as harmful during pregnancy but only 2 per cent avoided it during pregnancy [Jusudason and Shirur 1980]. Among 500 women interviewed in Karnataka 35 per cent reported avoidance Khanum and Umapathy. Papaya seems to be avoided during pregnancy most widely in Tamil Nadu. A study among 1,200 women from all districts of Tamil Nadu shows that 82 per cent of women avoided it during pregnancy [Ferro-Luzzi 1980].

In an attempt to find explanation for widespread avoidance of papaya in Tamil Nadu not only during pregnancy but also after delivery, at puberty and during, subsequent menstruation's, Ferro-Luzzi refers to the Tamil term for papaya, papali, which is comprised of two parts, pappa, meaning little child and ari meaning to destroy. The belief in the abortive power of papaya may be a corollary to the widespread belief that taking the fruit is closely followed by the onset of a due or overdue menstrual period. Papaya contains a digestive enzyme, papain, which acts on protein. It is used for softening meat in some parts of India but not in Tamil Nadu. Ferro-Luzzi thinks that the resemblance of papaya with female breast (recognized in Portugal and Puerto Rico) and a few of its other characteristics suggesting female analogies may be associated with the belief in its harmful effect on women. Such an association was, however, not mentioned by any woman in the study sample.

Banana is mentioned as harmful for pregnant women in both the studies conducted in Andhra Pradesh as well as in Gujarat and in one each of the studies conducted in Karnataka and Tamil Nadu. Banana is perceived as 'hot' in some places and 'cold' in others, but it is uniformly believed to be harmful though the reasons for the belief varies from place to place.

Jackfruit and pineapple are believed to be harmful for pregnant women in some communities and the most common reason given for their avoidance is that they are 'hot', often but not necessarily implying that they may induce abortion. Jackfruit is believed to cause infection in both mother and foetus in Karnataka [Neither and Neither 1989] and to cause fits, in baby in Tamil Nadu [Ferro-Luzzi]. Avoidance of pineapple in Tamil Nadu illustrates very well the behavioral variation that may exist, in the same state. In Madurai district of Tamil Nadu 96 percent of women interviewed said they did not eat pineapple during pregnancy while 94 percent of women in Kanyakumari reported to have taken it freely. In Coimbatore and Nilgiri districts of Tamil Nadu almost nobody any objection to pineapple, but it was not readily available. The folk belief in the abortive quality of pineapple was corroborated by an ayurvedic physician in Tamil Nadu, according to whose statistics pineapple acts on the uterus of 5-10 percent of all women and causes bleeding [Ferro-Luzzi].

Eggplant seems to be the most commonly prohibited vegetable during pregnancy. In the studies reviewed for this paper, next in order of prohibition are pumpkin and sweet potato. Other vegetables mentioned as harmful are ashgourd, bamboo shoot, bittergourd, bottlegourd, beans, cucumber, drumstick, potato, spinach, and sweet potato land watergourd. Three of the four studies conducted in Tamil Nadu and one of two each in Andhra Pradesh Mahadevan and Gujarat [SRRT] do not include any vegetable in the list of foods believed to be harmful during pregnancy. There does not seem to be any commonality in the reasons given for avoidance of vegetables.

Among the grains, wheat and rice are more commonly believed to be harmful than others. Wheat has been mentioned as an harmful item in Gujarat [Pool 1987], Karnataka [Nichter and Nichter 1989], Uttar Pradesh Jeffery et al and Tamil Nadu [Ferro-Luzzi], mostly because it is 'hot' and may cause abortion. The reasons for avoidance of rice is more varied. In the Uttar Pradesh community it is believed to cause abortion not because it is 'hot' but it is 'heavy' ('badi'). In the Gujarat community it is believed to cause a sticky layer of 'fat' around foetus making it stuck to the womb. In the Karnataka community beaten rice is believed to be harmful because it causes excessive toxicity which results in infection both in mother and baby. In Tamil Nadu cold rice in water is believed to disturb the 'hot'-'cold' balance in the baby.

Other grains reported to be mentioned as harmful during pregnancy in various communities of India include bengalgram, horsegram, millet and pulses. Ferro-Luzzi found that in Tamil Nadu millet was rarely eaten by higher strata groups and in some districts it was avoided by 65-90 percent of women only when they were pregnant. Horsegram was avoided by 26 percent of women only when they

were pregnant. Jesudason and Shirur found that pulses were avoided in the Andhra Pradesh community only by a small proportion of pregnant women.

Among the seeds believed to be harmful during pregnancy, sesame seeds were more commonly mentioned than any other. It has been reported to be so in Gujarat [Pool 1987], Karnataka [Khanum and Umapathy; Rao, and Tamil Nadu Dumont, Ferro-Luzzi. In all three states sesame seeds are believed to be 'hot', including abortion. Of the 1,111 women in all districts of Tamil Nadu interviewed in the study conducted by Ferro-Luzzi, 75 percent abstained from sesame in one form or another during pregnancy. In that study sesame was second only to papaya as a food believed to induce abortion. The oil extracted from sesame seeds are widely used in India. However, sesame in the form of seeds is believed to be particularly 'hot'. In Tamil Nadu sesame seeds are though of as being endowed with special power of life and fertility, and of stimulating the ovaries thereby hastening maturity. The reputed quality of sesame in promoting menstrual discharge makes it dangerous during pregnancy. In Tamil Nadu mustard seeds are also believed to be abortificient but only by a small section of population.

In many areas of India large sections of population do not normally take animal foods because of religious prohibition or because they are not affordable. Hence it is not unlikely that some of the survey respondents asked to name the food items believed to be harmful during pregnancy would tend to exclude animal foods.

Egg is reported to be a restricted food during pregnancy in Andhra Pradesh [Jesudason and Shirur; Mahadevan, Gujarat [Pool, SRRT], Karnataka (Khanurn and Umapathy, Rao, Uttar Pradesh [Jeffery et al] and Tamil Nadu [Ferro-Luzzi]. Most communities cited its quality of being 'hot' and inducing abortion as reason for its avoidance. In Karnataka it is believed to cause red and blue patches on baby's face and body. In Tamil Nadu the main cause of avoidance is the fear of the baby big. It is also supposed to growing too big. It is also supposed to cause the disease 'muccadaippan', characterized by breathlessness or the symptoms and signs of pneumonia. In Tamil Nadu among 1.034 egg-eaters out of 1,200 women interviewed. 9 per cent avoided eggs during pregnancy. Among 1,106 interviewed in Andhra Pradesh 16 per cent reported egg as harmful during pregnancy but only 3 percent actually avoided during pregnancy [Jesudason and Shirur].

For religious reasons beef is taboo among the Hindus who constitute over 82 per cent of India's populating Non-vegetarians in various communities however, sometimes take chicken, goat, lamb or pork. The commonly cited reason for avoiding meat is its quality of 'hotless', which induces abortion. In Tamil Nadu

meat (usually pork and chicken) is believed to be not only 'hot' but also impure [Ferro-Luzzi]. If taken during pregnancy, it can cause vomiting, skin disease and deformity. If taken after seventh heath of pregnancy, the foetus can grow too large. In Andhra Pradesh 11 percent of women interviewed (1,106) reported chicken as harmful during pregnancy and 2 percent actually avoided during pregnancy.

Fish is reported to be harmful during pregnancy in studies conducted in Andhra Pradesh [Nichter and Nichter 1989], Gujarat [SRRT], Uttar Pradesh [Jeffery et al] and Tamil Nadu [Ferro-Luzzi], mostly because it is 'hot' and induces abortion. In one Gujarat community [Pool 1987] only dried fish is believed to be harmful and in one Andhra Pradesh community Mahadevan only a combination of fish and milk is believed to be so. In the Tamil Nadu survey among 1,200 women 998 were fish-eaters and among the latter 7 percent avoided fish during pregnancy.

Some women in Andhra Pradesh [Jesudason and Shirur], Gujarat [Pool; SRRT] and Tamil Nadu [Ferro-Luzzi] are reported to believe milk as harmful during pregnancy. Buffalo milk is believed to be more harmful than cow's milk. Milk is usually perceived as a 'cold' food, sometimes having an adverse effect on women's health. For example, in Tamil Nadu it is believed to produce gas and cause rheumatism. Restrictions against milk products, such as yoghurt, buttermilk and clarified butter ('ghee') are perhaps more common than against milk. But actual avoidance of milk products during pregnancy for their supposedly harmful effect is not widespread. For example only 3 per cent of the total sample of 1,200 women in Tamil Nadu reported avoidance of milk and milk products during pregnancy [Ferro-Luzzi].

Spices in general believed to be harmful in Gujarat [Pool; SRRT] and Uttar Pradesh [Jeffery et al] communities. Most of the studies reviewed for this paper mention one or more of the following spines as harmful during pregnancy: amaranth chilies, fenugreek, garlic, ginger, onion, salt, sour spices and tamarind. The reason most commonly cited for avoidance is their 'hotness', which induces abortion.

Consumption of alcohol among women is rare in India except among tribes and low Hindu castes. The samples interviewed in two Gujarat communities [Pool; SRRT] include a substantial proportion of women from tribes and low casts among whom consumption of alcohol in the form of today by women also is not uncommon. Today is reported as harmful during pregnancy in both these studies because they are 'hot'. The only other study, which mentioned today as such is form Andhra Pradesh [Jesudason and Shirur]. In this study 0.4 percent, 5 percent and 16 percent of women among 'scheduled' castes, ' backward' castes and other castes reported today as harmful during pregnancy.

Beneficial And Unusual Foods

Information about foods believed to be beneficial during pregnancy is less than that about those believed to be harmful (Table 3). The scantly data available regarding foods believed to be beneficial hardly allow any generalization. In general, items that are perceived as 'cold' are believed to be good for pregnant women. In one community in Gujarat [Pool], however, 'cold' foods are believed to be beneficial in first trimester and 'hot' foods in the third trimester. In this community body is perceived to be in a heated state during first trimester, in third trimester body needs further heat so that the baby can be expelled easily by melting the layer of 'fat' formed around it by 'cold' food. Milk, milk products and fruits were believed to be beneficial in Gujarat, Karnataka and Uttar Pradesh communities but in Andhra Pradesh and Tamil Nadu communities these were not mentioned as such. The ayurvedic system of medicine, documented in Charaka-Samhita recommends milk, butter and clarified butter ('ghee') for the well being of pregnant mother Sharma.

Table 3: Foods believed to be beneficial

Source and State	Food Items Believed Beneficial	Reason	Practice
(1) Mahadevan 1961, Andhra Pradesh	Rice water (Kali congee) Mercury in the form of rasa para with myrtle leaf pellets or cooked Toddy All items desired by pregnant women	Facilitates movement of foetus Provides strength, makes baby's skin fair and clear Helps movement and growth of foetus Keep mother happy and hence good for baby	16-32 oz consumed daily Consumed daily after 5th month by all except brahmin and few other castes
(2) Pool 1987, Gujarat	In third trimester all items believed to be 'hot': sesame seeds, papaya, eggplant, dried fish, onion, garlic, chillies, jaggery, toddy, most pulses, dates, fenugreek, egg, meat, spices In first trimester all items believed to be 'cold': yoghurt, buttermilk, bannan, groundnut, millet, rice, sugar, milk, wheat, most fruits, most vegetables, all left-overs	Help to build up necessary 'heat' to melt the layer of 'fat' formed around the foetus caused by 'cold' foods and hence prevent difficult delivery In early pregnancy stage body is in heated state, so 'cold' foods has to bring the necessary balance	Not available
(3) SRRT 1992, Gujarat	No specific food particularly beneficial		
(4) Khanum and	Milk with saffron	Gives strength,	Mostly practiced by

Umapathy 1976, Karnataka		improves baby's complexion	middle and high income groups
(5) Nichter and Nichter 1989, Karnataka	Tender coconut water, greengram, millet, amaranth, cumin seeds, ripe fruits Herbal decoctions made from aniseed, coriander, cumin seeds and other vegetable products	'Cold', cooling effect Purify and 'cool' biped, It medy for toxicity (nanju) and 'overtreating'	Consumption not observed to increase significantly unless obvious symptoms of 'over-heating' were observed
(6) Rao 1985, Karnataka	Freshly cooked food served hot Milk Fruits Clarified butter (ghee) Cardamoms, cloves	Easily digestible Easily digestible, good for location 'Cool', prestigious Palatable, good for lactation Help digestion	Not available
(7) Jeffery et al 1989, Uttar Pradesh	Clarified butter (ghee), goat's milk, fruits, sqaush, cucumber, carrot, spinach, yoghurt, buttermilk, sugar, honey, cinnamon	"Cold"	Unlikely for women to get
(8) Djurfeldt et al Lindberg 1975, Tamil Nadu Ferro-Luzzi 1980,	Rasam prepared from drumstick, herbal leaves, pepper, garlic, fenugreek, tamarind water Rice	Relieves morning sickness, vomiting, gradiness Relieves vomiting	Not available Not available

In one Gujarat community [SRRT] no specific food item was mentioned by survey respondents as beneficial for pregnant women. They were of view that food items, which were not believed to be harmful for pregnant mothers were good for them. Existence of beliefs regarding beneficial effect of specific food items on pregnant women do not necessarily imply their increased consumption because they are usually relatively expensive. Only higher income group women are likely to get some advantages out of such beliefs.

In one community living in Telengana region of Andhra Pradesh today--an unusual item-was believed to be beneficial during pregnancy. In-depth interviews with 50 respondents randomly picked from 26 Hindu castes revealed that the belief existed among all the castes except Brahmins and three other castes [Mahadevan].

About 16-32 oz of toddy consumed daily or frequently after fifth month of pregnancy was expected to help in intra-uterine movement of foetus and hence in its growth. If the newborn baby was found to be covered with 'dirt' (possibly vermix cameos mother was censured for not consuming toddy during pregnancy. So most women actually drank today regularly during pregnancy

whether they liked it or not. Toddy drinking was however, a regular habit among all-adult men and women in that community except the four castes mentioned above. It is supposed to help elimination and have a cooling effect, particularly during summer.

Craving For Unusual Foods

Some pregnant women in India, as in many other regions of the world, are reported to have craving for unusual-often bizarre-foods. Four studies among those reviewed for this paper report the prevalence of such craving (Table 4). In rural Uttar Pradesh some pregnant women have craving for earth, ash from cooking stove ('chulah'), uncooked nice, bitter foods and sweet things [Jeffery et al]. Among 500 mothers interviewed in hospital and clinics in Karnataka 18 per cent stated that during pregnancy they had the habit of taking mud, clay, ash, lime, raw nice and charcoal. Craving, for mud and clay was mentioned more commonly than other items [Khanum and Umapathy]. In another Karnataka community a few women reported craving for small pieces of stone and limestone, during pregnancy [Rao]. Out of 50 pregnant women interviewed in a Gujarat community six reported consumption of baked clay ('mati') and tamarind seeds [SRRT]. There are reports of pregnant women's craving for tamarind in Madurai district of Tamil Nadu Reynolds for clay in West Bengal Mitra and for handloom cloth, slate pencil, clay, charcoal and brick in unspecified localities Raghuram.

Table 4: Amount of food believed to be proper and food items craved for during pregnancy

Source and State	Amount Believed to be proper	Reason	Practice	Food Items Craved for (Pica)	Practice	Comment
(1) SRRT 1992, Gujarat	Most believed amount should be less than pre-pregnancy amount	Two contradictory reasons: (1) increased food makes foetus large and delivery difficult; (2) increased food makes foetus small (and hence unhealthy) because food leaves too little space for foetus to grow	22 out of 27 said they ate less during pregnancy; most women did not have much to eat any time; some ate less because they felt less hungry or uncomfortable if they the full meal during pregnancy	Baked clay (mati) and tamarind seeds	6 out of 50 women reported to have taken them	
(2) Khanum				Mud and clay (more	18 per cent had	Practice associated

and Umapathy 1976, Karnataka				common); ash, lime, raw rice, charcoal	habits; more in low-income group	with anemia
(3) Nichter and Nichter 1989, Karnataka	64 per cent of 282 women said a pregnant woman should cat less or same amount of food as before pregnancy	(1) Delivery easy when baby is small; (2) Foetus is viewed as growing in a space occupied by food, gas and urine, and hence less food would allow easy movement of foetus necessary for gaining strength; (3) Big baby not necessarily viewed as a healthy baby; (4) decreased felt need for because of less activity during pregnancy	Periodic spot visits to 10 pregnant women who stated why consumed less during pregnancy confirmed their statement; most of those who favored increased food consumption could not afford it; morning sickness was an important factor limiting consumption			
(4) Rao 1985, Karnataka	Should eat less during pregnancy	Big baby difficult to deliver	Most women ate less because of the fear of difficult delivery and partly because of decreased appetite during pregnancy	Small pieces of stone or limestone	"Several women admitte d craving"	
(5) Jeffery et al 1989, Uttar Pradesh	Should "fill her stomach" but excessive eating harmful	Makes foetus big and causes delivery risk; also the minority belief that foetus becomes cramped and baby becomes sickly	Beliefs and behavior vary few reported any change in diet	Earth, ash from chulla (cooking stove made of earth), uncooked rice, bitter foods, sweet foods		
(6) Matthew's and Benjamin 1979, Tamil Nadu	38 to 93 per cent of women in different survey areas did not think that less food		Over three quarters of women did not take increased amount during pregnancy			

	during pregnancy would harm the baby					

The craving for unusual substances that have no nutritional value is often referred to as pica. The word is derived from latin magpie, a bird of fickle appetite noted for its habit of eating or carrying away all manner of extraneous objects. Pica has been reported in all pans of the world and for all age groups and for both sexes. But it seems to occur more characteristically among young children, women in the childbearing cycle and in groups suffering from dearth of food or from deficiency in any important nutrient [Cooper 1951; Halstead; Rosso. The compulsion to eat earth including clay or other types of soil (geophagia) by pregnant women is very widespread. Clay has a high calcium content but there is some evidence that its intake in substantial quantity may lead to anemia because it inhibits absorption of iron in addition to other possible contributing factors Halsted, Minnich et al. No evidence of such relationship has been, however, found in India so far.

Amount of Food

Review literature on food beliefs and practices during pregnancy in India often mentions about the belief in the desirability of eating in moderation during pregnancy for the fear of having a large baby causing difficulty in childbirth Chatterjee; VHAI. There is, however, a dearth of empirical evidence of its behavioral implications and the extent to which it is changing as a result of antenatal services and education provided by the government and non-government agencies. Five of the studies reviewed for this paper give some information on beliefs regarding the amount of food believed to be proper during pregnancy (Table 4).

In their intensive study of two villages in Uttar Pradesh in 1982-83 Jeffery et al noted a common belief that a woman's strength can easily be sapped by pregnancy and that her diet should be supplemented with, foods regarded as beneficial for coolness and strength, "but not so much that the baby becomes too fat". Many women said that the excessive eating results in such a large baby that delivery becomes difficult and even dangerous. Reasons given for negative effect of excessive eating were, however, not always consistent. For example, one woman, who was initially warned that her baby would be too large because she was too greedy regarding food, actually delivered a small sickly baby. She was then blamed for eating so much that "her tubes became filled with food and the baby became cramped". Very few informants reported, however, any changes in their diet during pregnancy.

Majority of respondents in Nichters' (1989) study of two taluks of Karnataka in the 1980s thought it advisable to eat less or same amount of food as opposed to increased amount during pregnancy. As in Uttar Pradesh villages, the relative case in the delivery of a small baby was often cited as a reason but here it was reinforced by the belief that large baby is not necessarily a healthy baby and that in order for a baby to become healthy it should have sufficient space in the stomach for free movement. The foetus is viewed as growing in a "space occupied by food. gas and urine" and hence can have more space for movement if food consumed is less in amount. Some women said that, he felt need for food is decreased because of less activities during pregnancy. The major reason for low intake of food by both pregnant and non-pregnant women was their poor purchasing power but the fear of difficulty in delivering large babies and the concept of the need for adequate "baby space" for the foetus to grow healthy were responsible for some pregnant women actually consuming less than their normal diet. Periodic spot visits to 10 pregnant women who stated they took less amount of food during pregnancy confirmed their statements. Morning sickness was also an important reason for limiting food during pregnancy. There were, however, a few women who reported increased amount of food during pregnancy.

Most of the pregnant respondents (22 out of 27) in the 1991-92 study conducted by the SEWA - Rural Research Team in Gujarat villages said that they were eating less during pregnancy than what they normally ate. The queries regarding the reasons for eating less elicited initial responses like 'elders say so" or the discomfort of eating normal amount of food during pregnancy. Further probing indicated two contradictory beliefs shared in the community: (1) increased food, consumption by pregnant mother makes baby too large and hence causes health risk for mother during delivery; and (2) increased food consumption by mother hampers the growth and health of foetus because the foctus and food share the limited amount of space in the, abdomen (similar to the belief in Karnataka cited above). The first belief was more common among the tribal group called the Vasava: the second was more common among the two Hindu castes. Irrespective of their beliefs some women reported that during pregnancy they were unable to eat much because they felt less hungry or uncomfortable after a full meal.

In a controlled study to assess the influence of a health education project in five rural areas of Tamil Nadu with varying extent of MCH services, Mathews and Benjamin AE found that in areas with no or very little services 38 to 93 per cent of women thought that baby's health would not be affected if they did not eat enough food during pregnancy. Over three quarters of women in those areas did not take any additional food during pregnancy. In areas with better and longer services 71 to 83 percent of women thought that baby's health would be affected

if they did not eat enough food during pregnancy. So the MCH services seem to have had an effect on women's belief regarding proper food during pregnancy.

In a diet survey of 68 pregnant women in three villages of Karnataka. 30 refused to indicate the specific amount of food eaten by them during the last 24 hours because of their belief that being specific could have an adverse effect on their nutrition [Rao]. Most of the rest 38 women ate less during pregnancy partly due to their decreased appetite and partly with a view to restrict the size of the baby and avoid difficult childbirth.

Two other studies indicated wide prevalence of the practice of reducing or not increasing the amount of food during pregnancy. One of them conducted in 12 villages of Andhra Pradesh found that pregnant mother's diet was no different from usual family diet and that most of the pregnant mothers except a few who attended the nearby antenatal clinic did not think that pregnant and lactating mothers required additional food Karan et al. In another study conducted in an unspecified locality of India, 64 per tent of pregnant women restricted their intake of all foods during first six months of pregnancy mainly because they believed that small babies are easier to deliver Sood and Kapil. Other reasons given were avoidance of indigestion and advice of mothers-in-law or traditional birth attendants.

Nutritional Consequences

A number of diet surveys among women in Indian communities and hospitals have shown that the dietary intake of a high proportion of them is deficient in some essential nutrients, and that there is almost universally no increase of intake among low income group women during pregnancy Bhardwaj; Bhatia et al; Gopalan; Karan et al; Kaur et al; Khanum and Umapathy; Mathews and Benjamin; Matter and Wakefield; Nath and Geervani 1978; NIN, India; Nichter and Nichter 1989; Rao; Sood and Kapil; Tripathy et at; Walter and Wakefield. The average intake of pregnant women in both rural and urban areas ranges from 1,200 to 1,600 kcal per day. Urban women weigh an average of 43 kg prior to pregnancy and gain six kg during pregnancy. Rural women generally have to spend more energy than their urban counterpart because in addition to doing household chores they often have to do heavy agricultural tasks. Rural women weight an average of about one to two kg less and their fat-fold thickness is only half that of urban women Ramachandran.

The deficiency of iron and a few other nutrients in the food consumed by low income group Indian women is reflected in the wide prevalence of anemia among them both in their non-pregnant and pregnant condition. The reported prevalence rate of anemia among pregnant women (haemoglobin less than

11g/dl) ranges from 40 to 50 percent in some urban areas and 50 to 70 percent in some rural areas Jejeebhoy and Rama Rao; Ramachandran AP. According to a recent by an Indian Council of Medical Task Force, the National Nutritional Anaemic Prophylaxis Program started in 1970 for providing iron and folic acid supplements to pregnant women had very little impact in reducing the prevalence of anemia ICMR Task Force.

The deficiency in, dietary intake and its negative effect on the nutritional status of low income group women-both non-pregnant and pregnant-can be attributed mainly to widespread poverty and sex discrimination against women in household food consumption. Although India has been virtually self-sufficient in food productions since the late 1970s, a large proportion of its population cannot afford to get their minimum requirement of essential nutrients because of their low purchasing power. In household food distribution, pregnant women hardly get any special consideration. However, the widespread prevalence of beliefs regarding food during pregnancy, as described in this paper, raises the question whether these have any effect on the nutritional status of pregnant women in addition to that of poverty and sex discrimination.

The relative inadequacy of information on foods believed to be beneficial during pregnancy compared to those believed to be harmful may be due to investigators' bias to learn more about food taboos for theoretical and practical reasons. However, even when investigators were able to identify food items, which were believed by respondents to be beneficial or harmful for pregnant women, it was difficult for them to find out the actual consumption of these items.

Available information indicates that milk and milk products are believed to be beneficial in some communities and harmful in others but since these are relatively costly food items, pregnant women, at least of low-income groups, are likely to derive very little nutritional benefit because of a positive belief about them. For Example, in Uttar Pradesh villages studied by Jeffery et al, "dais and village women alike said that a pregnant woman requires foods locally defined as those which produce blood and therefore strength ('taquat'), such as milk, fruit, and also ghee (which is warm but not excessively so), yet few of our key informants reported any changes at all in their diets during pregnancy".

A few of the studies reviewed for this paper report that beliefs regarding harmfulness of some specific foods for pregnant women have negative impact on their nutritional status. For example, Nichter and Nichter (1989) think that in Karnataka villages restrictions of the commonly eaten nutrient-rich drumstick, bengalam, blackgram, groundnuts and others have a deleterious effect on pregnant women's nutrition. According to Ferro-Luzzi, widespread avoidance of

papaya (a rich source of vitamin A) by pregnant women in Tamil Nadu and other places contributes towards their vitamin A deficiency, a serious health problem throughout India. It can, however, be observed from Table 2 that most of the foods believed to be harmful were actually avoided by small proportion of women. Moreover, animal foods which are believed to be harmful for pregnant women are often not accessible to many women either because of religious restrictions or because they are not affordable. Hence, the beliefs regarding harmfulness of specific foods for pregnant women in various regions of India may contribute toward specific nutritional deficiencies among some localized groups, but perhaps do not affect significantly the caloric and protein intakes of a large proportion of pregnant women. However, this effect may be significant if any item of the staple diet of a community is believed to be harmful for pregnant women and if this belief leads to avoidance or reduced consumption of that item. On the basis of a review of available international literature on food and nutrition during pregnancy. Brems and Bere have concluded that the extent to which the phenomenon of "eating down" during pregnancy actually occurs and its effect on birth-weight are not known, and that the extent to which nutrition can affect foetal size is not a clear-cut issue. However, they think that the evidence for the relationship between weight gain during pregnancy and birth-weight is more compelling than that between weight gain during pregnancy and difficult deliveries. They raise a series of policy and program issues which, according to them, merit further research and discussion before deciding whether td encourage "eating up" during pregnancy and if so, how to do that effectively for specific cultures.

The review of literature on beliefs and practices in Indian communities presented in this paper indicates that the phenomenon of "eating down" during pregnancy-both in belief, system and in actual practice is quite common in India and may have negative effect on many pregnant women's nutritional level which is anyway low for other reasons. However, whether or not an increased consumption of food during pregnancy can lead to disproportionately large babies causing an increased occurrence of obstructed labor in India needs to be assessed carefully.

Obstructed labor is known to be the most common reason for a difficult delivery and is one of the leading causes of maternal mortality in developing countries, particularly in Africa Herz and Meashem; Liskin. One major reason of obstructed labor is the disproportion between and the size of foetus and the size of mother's pelvis. The foetopelvic disproportion can occur in three possible ways: (i) the pelvis of mother, because of childhood malnutrition or chronological under development may be too small; (ii) the baby may be too large; or (iii) a combination of both (Brems and Breg 1988). The shape and, to some extent, the size of the pelvis can be explained more by nutritional factors than by hormonal

or genetical factor Stewart. Maternal diabetes is the most commonly cited factor for disproportionately large foetus (macrosomia), but maternal weight gain during pregnancy, maternal pre-pregnancy weight and maternal height in addition to a few factors are also cited for such condition Golditch and Kirkman;. Lazer et, al.

Urban and rural women in India gain averages of only six, and five kgs during pregnancy respectively and the mean birth weights of both urban and rural infants average only 2.7 kgs Ramachandran AP. In consideration of low dietary in take during pregnancy, poor pre-pregnant nutritional status, low weight gain during pregnancy and low birth weight in India, the Indian Council of Medical Research has recommended that the dietary allowances for pregnant women should include an additional 300 kcal and 10 to 15 grams of protein daily, over and above the recommended in take for the age and weight- matched women during the non-pregnant period ICMR. The government of India has initiated a number of programs for providing supplementary food to pregnant women of lower socio-economic groups but a number of recent surveys have shown that the impact of these programs have been so far quite negligible India,; Jain and Agarwal; Jejeebhoy and Rama Rao. Although the shortcomings in the implementation of these programs may be the main factor responsible for their failure popular beliefs regarding food for pregnant women may have contributed to it.

The evidence of widespread belief regarding the relationship between increased consumption of food during pregnancy and difficult delivery does not necessarily demonstrate that the prevalence of obstructed delivery is very high in India at present or was so even in the past. The distressful incidence of a prolonged obstructed labor without adequate medical care, even if it is rare is likely to generate fear which spreads quickly and survives for a long time in rural communities. Ignorance about other causes of obstructed labor is likely to encourage the belief that it occurs mainly because of the large size of the baby becomes large because of increased food consumption during pregnancy. The available data regarding prevalence of obstructed labor in India is scarce. In her comprehensive review of a maternal morbidity in developing countries. Liskin (1992) has cited only one hospital study of obstructed labor in India Basu which shows prevalence rate of 2.9 percent - much lower than the estimated for a few African communities.

It is well known that in India and other developing countries a large proportion of babies die within the first five years of life because of their low birthweight and that maternal malnutrition is primarily responsible for low birthweight [Ebrahim 1987; Gopalan and Rao; Jejeebhoy and Rao; Lechting and Shrimpton 1987; Ramachandran]. Also, several intervention studies in India and elsewhere

have shown the positive effect of nutrient supplementation programs during pregnancy on birth-weight and other reproductive outcomes, if they are designed and implemented properly [Brems and Berg 1988; Dawn and Mitra; Iyengar. Hence, it seems reasonable to recommend that the programs in India to encourage "eating up" during pregnancy and to provide supplementary food to poor women who cannot afford it should be strengthened. In addition, the health education programs should take cognizance of the popular beliefs regarding food during pregnancy different regions of India and use innovative means to minimize their negative and maximize their positive nutritional effects. For example, in some communities such as those in Karnataka [Nickhter and Nichter 1989] and in Gujarat [SRRT], it may be desirable to emphasize the usefulness of mother's increased intake during pregnancy in making the baby strong rather than large or heavy.

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