



## A comparative Analysis of Infancy Nutrition among Dangolion tharu with gond

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### Abstract

Infancy is a period of one year after the birth of baby. This period is the time of most rapid growth. The average weight of most healthy new born baby is around 3.2 kg. Colostrum secreted during the first two or three days after delivery thick and yellowish fluid about 10-40 ml that is rich in protein. It is first immunization contains antibodies against viral disease such as small pox, polio, measles and influenza. Recommended strategies to promote breast feeding include, education programme, post-partum support and peer counselling, hospital rooming in of mother with infant, encouraging early maternal contact and frequent, on-demand breast-feeding, elimination of commercial discharge package for new mothers, and discouraging the early use of artificial nipples and pacifiers. Human milk is tailored precisely for the growth and development needs of the human infant. Breast milk contains taurine, an important nutrient for brain and nerve growth whereas cow milk contain none. It is also rich in vitamin A, C and E. The vitamin B content depends on material intake and meets calculated standards. The Supreme Court dated 28-11-01 has given direction by order passed for infants, children, pregnant women and lactating mothers. The direction for infants energy 300 kCal and 8-10 gm protein and for malnourished babies get 600 kCal and 16 to 20 gms of protein and efforts shall be made that all including SC/ST hamlet. The tharu and Gond tribes are populated at Indo-Nepal border both were recognized as schedule tribes by Govt. of India gives many special social, educational, economic and other rights. They were primary victim of the backwardness. The main objective of the paper is to analyze comparatively the infancy nutrition with government assistance among dangolion Tharus and Gond Schedule Tribe population. The validation cohort n=50 in each community of Tharu of Balrampur district and Gond of Basti district of U.P., India. The main findings of the paper, the higher the frequency and time per time of breast feeding 12 times and 10 minutes or more among halves of 0-6 month of age groups, and higher the intake of chaknabhat with breast feeding more than 12 times observed a healthy or overweight infants. Whereas the awareness for requirement of infants nutrition attitude and practices were found negligible. The calculated value of chi-square was found much more higher (38) as compared to table value (3.841) at one degree of freedom and 5% significant level. Therefore null hypothesis rejected and alternate hypothesis accepted i.e. healthy nutrition brings healthy infancy among both community Tharu and Gond.

**Keywords:** Infancy, colostrum, human milk, Taurine, Dangolion, Tharu, Gond, Infancy Nutrition.

### Introduction

Infancy is a period of one year after the birth of baby. Next to foetal period, the infants first year is the time of most rapid growth. The average weight of most healthy new born babies is around 3.2 kg. The infant should be put to breast feeding within half an hour after normal delivery and without four hours after caesarian sections. Prelactal foods like honey, distilled water or glucose should not be given. These foods will satisfy the thirst and will reduce the vigour to suck and may lead to diarrhea and helminthic infestation. Breast feeding can be initiated even when the mother is sedated or on IV fluids. Sucking reflex is most active at the time of birth. ICMR recommended dietary allowance for infancy given in table-1. Colostrum; during the past two or three days after delivery thick and yellowish fluid is secreted from the mammary gland. This differs from the regular milk. It is secreted in small quantity of about 10-40 ml. It is rich in protein. The composition of colostrum are as Table-2. The total fat content of colostrum is less than mature milk. Concentration of arachidemic acid and docosa hexa enoic acid

(DHA) as per cent of total fatty acid is higher in colostrum than mature milk. It is first immunization to the infant. It contains an interferon like substance which possesses strong antiviral activity. It also contains B<sup>12</sup> binding protein which renders B<sup>12</sup> unavailability for the growth of coli and other bacteria. Colostrum contains antibodies against viral disease such as small pox, polio, measles and influenza<sup>1</sup>. Enzymes like lysozyme, peroxidase and xanthine oxidase than promote cell maturation are found to be more in colostrum. Colostrum contains large quantities of protective substances and enhances the development and maturation of baby's gastro intestinal tract. It also helps a baby pass him or her first stool. The milk increases in quantity and changes in appearance and composition during next two weeks called transition milks. The sugar and fat content increases and immune globulin and protein content decreases. It minimizes infection related to neonatal deaths. Foremilk which is watery has a low level of fat and is high in lactose sugar, protein, vitamins, minerals and water. The milk that comes at the start of a feed is called foremilk. Hind milk which comes later in a feed, is richer in fat. It satisfies the

baby's hunger and supplies more energy than foremilk. Babies who are fed fore and hind milk sleep well and grow healthy<sup>2</sup>. Exclusive breast feeding is adequate for the first four to six month of age for almost all infants. Recommended strategies to promote breast feeding include education programs, post partum support and peer counselling, hospital rooming in of mother with infant, encouraging early maternal contact and frequent, on-demand breast-feeding, elimination of commercial discharge packages for new mothers, and discouraging the early use of artificial nipples and pacifiers. Differences in energy requirements between breast feed and formula-fed infants result from lower energy excretion in breast feed infants and higher energy cost of tissue synthesis (greater fat deposition) in formula-fed infants characteristics in table-3. The goal to increase to at least 75% the proportion of mothers who breast feed their babies in the early post partum period, to at least 50% the proportion who breast feed up to 6 months, and at least 25% the proportion who breast feed up to 1 year in 1998, these proportions were 64%, 29% and 16% respectively. Human milk is tailored precisely for the growth and development needs of the human infant. The protein content of breast milk is lower than that of other species (1% versus 3% in cow milk) where young double their birth weight and wean quickly in days of weeks. The profile of amino acids in human milk is ideal not only for absorption but for utilization, especially by the brain. The composition of human milk relative to infant needs for essential amino acids. The main protein in cow milk, casein, forms a somewhat indigestible curd and has high levels of phenylalanine, tyrosine, and methionine for which the infant has little digestive enzyme resources. Cow milk contains little lactalbumin and cysteine, which the infant can digest readily. Human milk contains taurine, an important nutrient for brain and nerve growth, whereas cow milk contains none, so taurine must be added to most infant formulas (table 4 and 5). Human milk is rich in vitamin A, C and B. The B-vitamin content depends on maternal intake and meets calculated standards. Because the primary source of vitamin B6 and the only source of vitamin B12 are animal products, vegetarian mothers (especially strict vegans) may produce milk that is deficient in these vitamins unless they supplement their diet. It is recommended that all infants, including those who are exclusively breast feed and those with formula intakes less than 500 ml, should have a minimum intake of 200 IU of vitamin D daily beginning in the first two months. The vitamin D content of human milk (25 IU/L) is lower than that of cow milk, so supplementation is advisable in breast feed infants if sun exposure is restricted. All new born should receive a 0.5 to 1 mg injection or a 2 mg oral dose of vitamin K immediately after birth, regardless of whether breast feeding or bottle feeding will be used<sup>2</sup>. The fat profiles of human milk is predominantly saturated and monosaturated fat (only about 15% polyunsaturated fats) with a stable amounts of cholesterol, regardless of the mothers' cholesterol intake. Cholesterol is an

important constituent of brain and nerve tissue as well as a precursor of steroid hormones and bile acids. Most formulae contain no cholesterol and contain fats of varying quality as compared to cow milk fat. Animal and human studies suggest a strong relationship between intake of the long-chain omega-3 polyunsaturated fatty acid docosahexaenoic acid (DHA; 22.6,n-3) and visual acuity and cognitive function. DHA is present in human milk but absent from cow milk. Some commercial formulae are now fortified with DHA from single cell oils (0.2% of the fatty acids)<sup>3</sup>. Realising that aggressive marketing of infant foods and feeding bottles leads to a decline in breast feeding, the World Health Assembly in 1981 passed an International code of marketing of Breast milk Substitute. In 1992, the government of India passed the infant milk substitutes feeding bottles and Infant Foods Act 1992, which came into force 1<sup>st</sup> of August, 1993.

**Table-1**  
**Recommended Body Weight and Nutritional Requirement for Infants**

Group	0-6 months	6-12 months
Body wt (kg)	5.4	8.4
Net Energy (kCal/day)	92	80
Protein (gm/kg/day)	1.16	1.69
Visible Fat (gm/day)	-	19
Calcium (mg/d)	500	500
Iron (mg/d)	46	5
Zinc (mg/d)	-	-
Magnesium (mg/d)	30	45
Retinol (mg/day)	350	350
B-carotene mcq	-	2800
Thiamine (mg/dl)	0.2	0.3
Riboflavin (mg/dl)	0.3	0.4
Niacin equivalent (mg/kg)	700	650
Vitamin B6 mg/dl	0.1	0.4
Ascorbin Acid mg/dl	25	25
Dietary Folate mg/dl	25	25
Vitamin B12 mg/dl	0.2	0.2

Source: ICMR, 2010

**Table -2**  
**Colostrum Composition<sup>4</sup>**

Nutrients	Amount
Energy (kCal)	58
Fat (gm)	2.9
Calcium(gm)	31
Phosphorus(mg)	14
Iron(mg)	0.09
Protein(gm)	2.7
Lactose(gm)	5.3
Carotene (I.U.)	186
Vitamin-A (IU)	296

**Table-3**  
**Advantages and Disadvantages of Breast Milk<sup>5</sup>**

<b>Humoral Factors</b>	
PgA	Confers passive mucosal protection of gastrointestinal tract against penetration of intestinal organism and antigens.
Bifidus Factor	Supports growth of Lactobacillus lipidus, a microorganism that converts Lactose to acetic and lactic acids; low resulting pH – inhibits growth of coli and protects against staphilococcus aureus shigella, and protozoal infections.
Lysozymes	Bacteriolytic enzymes that act against Enterobacteriaceae and gram-positive bacteria.
Lactogerin	Iron-binding whey protein bacteriostatic effect on S.aureaus and Coli by limiting Iron available for their growth.
Interferon	Antiviral protein
<b>Cellular Factors</b>	
Macrophages	Phagocytize bacteria and viruses in the gut; synthesize complement lysozyme, and lactoferrin
Lymphocytes	T-celli; may transfer delayed hypersensitivity from mother to infant; B-cells; synthesize Ig.
<b>Advantages (Nutritional properties)</b>	<b>Comments</b>
<b>Protein Quality</b>	
60:40 Whey/Casein Ratio	Forms small, soft, easily digestible curd in stomach; essential amino acids (cysteine) provided in higher concentration by whey non-protein nitrogen postulated to play a role in anabolism and growth.
Hypoallergenic	Reduces potential for allergic reactions
<b>Lipid Quality</b>	
High oleic acid content	Improves Digestibility and absorbability of lipid by increasing lipolytic enzymes ability to act stereospecifically
Lipolytic activity Cholesterol	Improves fat absorption; possible facilitate formation of nerve tissue and synthesis of bib salts; necessary for optimal development of cholesterol regulatory mechanism.
<b>Disadvantages</b>	<b>Comments</b>
Possible nutrient inadequacies	may develop vitamin D and Iron deficiencies with prolonged breast feeding if supplements or a variety of solid foods are not initiated.
Inborn errors of metabolism maternal drugs (antithyroid, antimetabolite, anticoagulant)	Inappropriate nutrient composition may be hazardous to the nursing infant.
Environmental contaminants (herbicides, pesticides, insecticides, radioisotopes)	Have unknown effects on exposed children; no practical way to monitor contamination of human milk
Human immunodeficiency virus (HIV)	Possible transmission to infants.

**Table- 4**  
**Essential Amino Acid Composition of Breast Milk And A Casein – Based Formula relative to Infant Requirements**

Essential Amino Acid	Intake 150 ml/kg/day		
	Breast Milk	Casein-based formula	Requirement mg/kg/day
Histidine	37	45	28
Isoleucine	90	112	70
Leucine	155	210	161
Lysine	105	155	103
Methionine and Cystine	68	82	58
Phenylalanine and Tyrosine	135	190	125
Threonine	75	100	87
Tryptophan	30	30	17
Valine	100	120	93
Taurine	7.5	7	-

**Table-5**  
**Fat Component of Breast Milk Relative to A Whey Based Formula<sup>5</sup>**

	Breast Milk	Whey Based Formula
Total (gm/dl)	3.5-4.5	3.8
Triglycerides	98-99	99
Cholesterol (mg/dl)	10-15	-
Phospholipids (mg/dl)	15-20	30
Fatty Acids (%)		
Oleic (18:1)	35	16
Palmitic (16:0)	22	10
Linoleic (18:2,n-6)	15	32
Myristic (14:0)	6	9
Lauric (12:0)	4	1
Lindenic (18:3, Omega-3)	1	1
Medium Chain Triglycerides	10	8

Introducing solid food according to age specific; 1-6 month – breast milk or formula only, 6-7 month – Iron fortified cereal, fruits (strained or mashed); cup introduced; 7-8 month – vegetables (strained or mashed); 8-9 month – Finger food (eg. Crackers, bananas and chopped(junior)); 9 month – meat and citrus juice; 10-11 month – Bite size cooked food; 12 month – all table food.

**Guidelines for introducing solid food:** Begin with single-ingredient foods; add one at a time, introduce a small amount of each new food beginning with 1 to 2 tsp, and gradually increase the amount to 3 to 4 tsp. per feeding. Wait 3 to 5 days before adding another new food, discontinue the last food if an adverse reaction occurs. Ultimately, offer a wide variety of food. For older infants include milk, meat, fruits, vegetables, bread, a cereal for nutritional adequacy and diversity. Avoid mixing solids with fluids so that the infant can learn textures and flavors and develop facial muscles (exception; for infants with reflux, add rice cereal to thicken meals). Never put a baby to bed with a bottle or allow a baby to suck a bottle continuously during the day to maximize the risk of dental caries and adverse tooth eruption. Provide solids with texture that are compatible with

the infants ability to chew and swallow. The finger foods for infants; preferred; bread, toast, unsalted crackers, fruits; items that are fresh or canned (unsweetened), soft and without seeds or peels (bananas, apples, peaches, apricots).Meat, poultry, fish; items that are tender and in small cooked pieces or strips without bones (meat balls, meat sticks, hamburger, meat, loaf, chicken, nuggets, turkey, fish, sticks. Vegetables; items that are tender and in cooked whole pieces or chunks (carrots, green beans, squash, potatoes). Avoid; popcorn, nuts, seeds, unmashed peas, raw carrots, raisins, potato chips, hard candies, corn kernels (because of potential for choking and aspiration).

Potential disadvantages for introducing solid foods before 6 months of age<sup>3</sup>: Poor oral-molar coordination, insufficient energy and nutrient replacement for breast milk or infant formula. Increased risk of food allergies. Increased renal solute load and hyper osmolarity. Disturbing appetite regulation possibly encouraging overfeeding. Increased likelihood of infants desiring sugar and salt in life. A large number of pharma product for artificial feeding and food supplement are available in the market that should be used in accordance with requirements. The Supreme Court dated 28-11-01 has given directions by order for infants, children, pregnant women and lactating mothers. The direction for infants were :each child up to 6 years of age to get 300 kCal and 8-10 gms of protein and each malnourished child to get 600 kCal and 16 to 20 gms of protein and effort shall be made that all SC/ST hamlet/inhabitation in the country have Anganbadi centres as early as possible. ASHA- Bahu Yojna also implemented in our country to fulfill the nutritional approach among vulnerable class population that should be needed to evaluate the programs achievement and assess the role of nutrition provided by such programme for infants malnourishment. Janani Suraksha Yojana for newly born infant and lactating mothers is also helpful to providing infants nutrition to vulnerable class population that also to be needed to evaluate among Tharu ST population. The Tharu tribe is a most popular tribe of India and Nepal. The Tharu people are indigenous people living in the Terai plains on the border of Nepal and India. The population of Tharu in the state of Uttar Pradesh 83544 and 85665 in Uttarakhand. They

are mostly populated in Champaran District of Bihar, and in Udham Singh Nagar District of Uttarakhand, Kheeri, Pilibhit, Gonda, Balrampur, Gorakhpur, Bahirayach district of Uttar Pradesh. The Tharu are recognized as schedule tribes by the Government of India. Constitution of India gives many special social, educational, economic and other rights to these schedule tribes because they are the primary victims of the backwardness.

On the other hand newly declared schedule tribe including Gond tribe having their population 148029. Apart from Uttar Pradesh Gond is residing in four states of Bihar, Madhya Pradesh, Andhra Pradesh and Orissa also. There are many views about the origin of "Gond". According to Sir Kannengham, the word Gond was originated from the word of Gaura. Another way Gond have connected with Gondwana and Gond Sila hill. It is believed that the ancestors of Gond was migrated from these places. However, the origin of Gond is still a puzzle. Bhunia, Nayak, Ojha, Patheri and Rajgond are the sub castes of Gond. They have the salient features of tribe e.g. Primitiveness, different culture, shyness in mixing with others, backwardness and living in a special remota area. Contrary, the Tharu culture is very "eco-friendly", all cultural activities of this tribe are deeply related with nature. Their residence, food, clothing, religion, economy and many other aspects of life are based on nature and maintaining an ecological balance. The Tharu people worship mainly their tribal Goddess, the Earth, called "Bhumsen" in their folk language. There is a well-organized family system in this community. Historically they are not tribal community because they are migrated Rajput (Upper Caste Hindus) which has been converted in a tribal community in the period of living in forest.

Within the broad package of services of supplementary nutrition, immunization, non-formal pre-school education, nutrition and health education, health check-up, referral services, there are different services for different groups of people. From this point of view, the population is divided into five broad groups according to their age and needs, children less than one year old children above one year but below 3 years of age children above 3 years but below 6 years of age. Expectant and nursing mothers. All women between the age of 15 to 45 years.

It was argued by Government that 300 days in a year, supplementary nutrition is given to malnourished children below six years, pregnant women and nursing mothers. Children below three years were given special attention. Malnourished children falling into grade III and IV are given extra diet/therapeutic nutrition<sup>6</sup>.

In spite of a greater steps carried by government and NGOs in tribal areas continue to suffer as it was that need to evaluate the programmes in respect of their coordination, peoples participation etc. with formulation and implementation for tribal population specially infancy nutrition.

Ignorance of tribal women, promoting her traditionality is again reflected in the arena of health and hygiene. This ensures continuity to many health hazards at family and village levels. Most of the tribal women continue to adhere to the traditional concepts of disease and cures. As such they chiefly consult and depend upon the local curer or healer who operates on the ritual of exorcism which is in many cases, very time consuming and superstition based<sup>7</sup>. That also needed to evaluate the government programme and their implementation for health and disease care.

**Aims and Objectives:** The main objective of the paper to analyze comparatively the infancy nutrition along with to evaluate the government assistance and to assess the role of nutritional intake for healthy infancy among Dangolian Tharu with Gond Schedule Tribe population.

### Hypothesis:

**Null Hypothesis:** Healthy Nutrition could not bring healthy infancy among Tharu and Gond schedule tribe infants.

**Alternate Hypothesis:** Healthy Nutrition brings healthy infancy among Tharu and Gonds schedule tribe infants.

### Methodology

**Study area:** The paper was prepared at Dangolian Tharu Schedule Tribe at Deegha village of Balrampur district and Gond schedule tribe population of Pathari Tola of Banshi town of Basti district of state UP of India.

**Sample Size:** A fifty sample from each two schedule tribe population (i.e. 100) were selected for the purpose of study.

**Tools:** An interview schedule method was used to record information and primary data in face to face situation.

**Parameters:** Weight of infants, Breast feeding time and frequency, RDA and RDI of infants.

**Research Design:** Exploratory cum explanatory research design.

**Analysis of Data:** The collected data was tabulated and analyzed in accordance with statistical and scientific method. The chi-square test was used to test the hypothesis.

### Conclusion

Ages of subjects; among tharu tribe; in the age group of 0-3 month; 11% 3-6 month 12% 6-9 month 12% and 9-12 month 15% and among Gond tribe 0-3 month 10% 3-6 month 15% 6-9 month 15% and 9-12 month 10%. All the subjects family earning was depend on farming and agricultural labour. The obesity status of the subject as recommended their weight 3.2 kg

a 62% Tharu infants whereas 48% Gond infant underweight at the time of birth. The overweight infants include 12% tharus whereas 18% Gond. The rest infants 26% of tharus whereas 34% were found healthy at the time of birth. At the time of enquiry a 66% of Tharus infants are underweight. On the other 42% of Gond infants found underweight. The over weight babies found only 6%, 4% Tharus and Gond scheduled tribe. The number of times taking breast feeding : 6-8 times 8% tharus and 6% Gond, 8 to 12 times 30% Tharus and 28% Gond and rest more than 12 times 62% Tharus and 66% Gond infants depend upon breast feeding. A female was called healthy when they give birth to more than five children in both tharus and Gond scheduled tribes. None infant was found taking any supplementary pharma nutrients and nutrition during infancy nutrition because of poverty and lack of awareness for any product in both scheduled tribe community Tharu and Gond. According to single time duration the breast feeding approx 5 minutes 16% tharus and 8% Gond, approx 10 minutes 42% Tharus and 48% Gond infants and rest more than 10 minutes 42% Tharus and 44% Gond infants. The dietary intake was observed after six month along with breast feeding among cent percent subjects. None pregnant women and lactating mothers were found taking extra diet during pregnancy and lactation. The diet of pregnant women and lactating mother were 'chakna-bhat' among Tharus and 'routine diet' among Gond. The 'chakna-bhat' was made up of rice, potatoes and small amount spices, oil and fish. The routine diet among Gond was rice, bread, pulses etc as they afford economically. None infants were observed taking cow buffaloes milk during infancy. After delivery infants were getting first time honey, sugar solution, water, and in some cases home made wine. The breast feeding first started when the infants become weeping in both communities. None respondents were benefitted for Janani Suraksha Yojana among both communities Tharu and Gond. The treatment taken for infancy through 'Guruwa' through indigenous medicine among tharus whereas among Gond by unregistered medical practicers. Elder sister or elder brother took care to infants during day time when lactating mother laboring at form as a agricultural labour. When infants begins to weeping then mother giving breast feeding to infants. Therefore child care practices carrying by elder sister or brother. Killed disabled and twin babies by both communities Tharus and Gonds. In some cases twins like in gond Tribes and not killed. It was observed that among the group of below six month babies those taking breast feeding at higher frequency more than 12 times and their duration 10 minutes or more found healthy or

overweight among both communities tharu and Gond (approx 40% babies). It was also observed that the age group of 6-12 month those were take 'Chakna' and 'routine diet' with breast feeding attained healthy and overweight among tharus and Gond both.

It was also evident from the calculated value of Chi-square was found much more higher (38 and 26.0) as compared to table value (3.841) at one degree of freedom and five percent significant level, therefore null hypothesis rejected and alternate hypothesis i.e. healthy nutrition brings healthy infancy among both schedule tribe infants, Tharus and Gonds. The child care practice for infancy primitive and indigenous way among both communities Tharus and Gonds. It was serious thinking that cent per cent respondent mothers unaware for requirement of healthy diet for infancy, pregnancy and lactation. In terms of attitude and practices it was also totally absent for requirement of healthy nutrition. On the other hand government of India and state spent a lot of money on the development of SC/ST population that to be seems only on paper. The ground reality it was found negligible. People participation and coordination it was found negligible. Aganbadis, ASHA BAHU and other field staff blamed to administration set/up and functioning.

As for the concerned of government plan for infancy nutrition the vulnerable class unaware for their benefits. The KAP of government program formulation and implementation for infancy nutrition against government machinery totally absent.

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