

CUET · HOME SCIENCE · CLASS XI · CODE 315

Nutrition, Health and Well-being

CUET unit: Unit III – Childhood (Nutrition, Health and Well-being of children)

By UniDrill · NCERT-grounded study material

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Snapshot

- Establishes that nutritional needs of children depend on rate of growth, body weight and stage of development; deficiency in childhood can cause lifelong impairments.
- Covers nutrition across three child stages — infancy (birth–12 months), preschool (1–6 years) and school-age (7–12 years) — with ICMR-prescribed RDAs for each.
- Details breast feeding, colostrum, complementary feeding, low-cost Indian weaning foods (Balahar, Poshak, Amutham etc.) and the National Immunisation Schedule.
- Lists common child nutrition disorders (PEM, anaemia, xerophthalmia, rickets, goitre) and growing problems among school-age children (obesity, Type II diabetes, hypertension).
- High-yield CUET chapter — recurring direct-fact items on immunisation ages, RDA tables, deficiency-disease pairings and definitions (colostrum, malnutrition, obesity).

Detailed Notes

2.1 Core concepts

This is the foundational paediatric-nutrition chapter of Class XI, the first of Part II. It covers the three childhood phases — infancy, preschool, school age — and integrates ICMR-NIN RDA tables with India's National Immunisation Schedule, Universal Immunisation Programme (UIP) timing, breast-feeding guidance from the Ministry of Health & Family Welfare and WHO, and ICDS/Mid-Day Meal Scheme references. It is a numbers-and-tables goldmine for CUET — RDA per kg, immunisation ages, vaccine acronyms, and ICMR balanced-diet quantities are recall staples.

- Nutrition is "food at work" — the process by which we obtain nutrients and metabolise them for growth, repair and well-being; adequate nutrition supports organ function, cognition, immunity, energy and positive attitude (NCERT §8.1, p. 152–153).
- Infancy (birth–12 months) is marked by phenomenal growth; infants need about twice the calories per kg body weight as an adult doing heavy work. Weight doubles

- in 6 months and triples in 1 year; length rises from 50–55 cm at birth to 75 cm by 1 year (NCERT §8.2, p. 153).
- Besides energy, infants specifically need Protein (muscular growth), Calcium (healthy bones) and Iron (growth and expansion of blood volume) (NCERT §8.2, p. 153).
 - RDA Table 1: 0–6 months — Energy 108 kcal/kg, Protein 2.05 g/kg, Calcium 500 mg; 6–12 months — Energy 98 kcal/kg, Protein 1.65 g/kg, Calcium 500 mg (NCERT Table 1, p. 154).
 - Breast feeding: WHO recommends exclusive breast feeding for six months; even water is not needed. The yellow fluid produced in the first 2–3 days is colostrum, very rich in antibodies (NCERT §8.2 Breast feeding, p. 154).
 - Benefits of breast milk: tailor-made nutrients, emulsified fat, low protein (reduces kidney load), Vitamin C preserved, hygienic, antibodies giving natural immunity against gastro-intestinal/chest/urinary infections; protects mother against breast/ovarian cancer and weak bones (NCERT §8.2, p. 154–155).
 - Low birth weight = baby weighing less than 2.5 kg at birth; such babies have poor sucking/swallowing reflexes and need vitamins, calcium, phosphorus and iron in addition to breast milk (NCERT §8.2 Feeding the low birth weight infant, p. 155).
 - Complementary foods are introduced gradually by 6 months: liquid complements (diluted milk 3:1, citrus juices from 4 months, soups), semi-solid complements by 5–6 months (mashed veg, pulse + cereal, egg yolk from 7 months), and solid complements by 10 months–1 year (dals, cereals, minced meat, raw salad/fruit as finger foods). Should be calorie-dense providing at least 10% energy as protein (NCERT Table 2, p. 156).
 - Indian low-cost complementary foods include Indian Multipurpose Flour (75:25), Malt food (4:4:2), Balahar (7:2:2), Win food (5:2:2:2), Poshak (4:2:1:2), Amutham (1.5:1.5:1.5:2.5:2.5), Amritham (4:2:1:1:2) (NCERT §8.2 Complementary foods, p. 156).
 - National Immunisation Schedule (Table 3): Birth — BCG, OPV, HEP B; 6, 10, 14 weeks — OPV + PENTA (DPT, HEP B, HiB); 9 months — MR (Measles, Rubella) (NCERT Table 3, p. 157).
 - Common child deficiency diseases: Protein-Energy Malnutrition (PEM) → growth retardation; Anaemia (iron); Nutritional blindness (Vitamin A); Rickets/osteopenia (Vitamin D + calcium); Goitre (iodine) (NCERT §8.2 Common health problems, p. 158).
 - Six dreaded communicable diseases that immunisation protects against: polio, diphtheria, tuberculosis, pertussis, measles and tetanus (NCERT §8.2, p. 158).
 - Preschoolers (1–6 yrs) — growth slows compared with infancy but child remains very active; RDA (Table 4): 1–3 yrs — 1240 kcal, 22 g protein; 4–6 yrs — 1690 kcal, 30 g protein; Calcium 400 mg; Iron 12–18 mg (NCERT §8.3 Table 4, p. 159).

- Preschool diets must emphasise three aspects: Variety (textures/colours), Balance (carbs, lean protein, fats) and Moderation (sweets/fats). Universal use of iodised salt prevents Iodine Deficiency Disorders (NCERT §8.3, p. 160–161).
- ICMR balanced diet for preschoolers (Table 5): Cereals 60/120 g, Pulses 30 g, Milk 500 ml, Fruits & Vegetables (roots 50/100, leafy 50/50, others 50/100, fruits 100), Sugar 15/25 g, Fats/Oils 20/25 g (NCERT Table 5, p. 161).
- Booster Immunisation Table 6: 15–18 months — MMR; 16 months–2 yrs — DPT, OPV booster; 2 yrs — Typhoid; 10 yrs and 16 yrs — Tetanus Toxoid (TT) (NCERT Table 6, p. 163).
- School-age children (7–12 yrs): latent growth period; nutrient needs identical for boys and girls up to 9 years, then diverge. RDA (Table 7): 7–9 yrs — 1690 kcal, 29.5 g protein; 10–12 yrs Boys — 2190 kcal, 39.9 g; Girls — 2010 kcal, 40.4 g, Iron 27 mg (highest for girls) for menarche (NCERT §8.4 Table 7, p. 164).
- Diet planning principles for school children: aim for variety, ensure good nutrition (more protein/calcium/iron/iodine), limit saturated fat/salt/sugar (fat \leq 20% calories), never skip breakfast, involve children in meal planning (NCERT §8.4 Planning diets, p. 165).
- Factors influencing diet intake: Family environment, Media (TV ads), Peers, Socio-cultural influences and Erratic appetite (NCERT §8.4 Factors that influence diet intake, p. 167–168).
- Healthy habits for school children: sensible eating, physical activity 45–60 min, food safety, control over quantity intake (NCERT §8.4 Healthy habits, p. 168).
- Health and nutrition issues of school age: rising obesity (high-salt/fatty foods, low fibre, sedentary lifestyle); Type II diabetes and hypertension now seen in youngsters; under-nutrition still serious in lower socio-economic groups; Mid-Day Meal Scheme (MDMS) for Classes I–VIII has improved attendance, performance and reduced gender gap (NCERT §8.4 Health and nutrition issues, p. 169).

To deepen each section: infancy nutrition is dominated by the breast-feeding paradigm. The WHO recommends exclusive breast feeding for the first six months — no water, no honey, no formula — because breast milk is composed of approximately 88% water, supplying all the fluid the infant needs. Colostrum, the yellow first-three-day fluid, is the infant's first vaccine: it is rich in IgA, lactoferrin, growth factors and white cells, and protects the new-born gut from infection. The 'tailor-made' nature of breast milk includes emulsified fat (easier to digest), low protein (reducing kidney load on a still-immature renal system), preserved vitamin C (which is destroyed on heating), and species-specific antibodies. Maternal benefits too — reduced risk of breast and ovarian cancer and reduced post-partum bone loss — an important point for Indian women whose lifelong calcium intake is often inadequate.

Low birth weight (LBW = under 2.5 kg) is endemic in India (around one-third of all births per NFHS estimates), and LBW infants need special feeding adjustments — vitamin, calcium, phosphorus and iron supplementation in addition to breast milk, given poor

sucking-swallowing reflexes. Complementary feeding starts at six months because infant iron stores from birth are depleted and energy needs outstrip what breast milk alone can supply. Calorie-dense complementary foods should provide at least 10% of energy as protein — the conceptual basis of ICDS's Take-Home Ration packets and Anganwadi Hot Cooked Meals. NCERT-named Indian low-cost weaning mixes — Indian Multipurpose Flour (75 wheat: 25 Bengal-gram), Malt food (4:4:2), Balahar (7 wheat: 2 Bengal-gram: 2 GNC + oil), Win Food (5 wheat: 2 Bengal-gram: 2 GNC: 2 jaggery), Poshak (4 wheat: 2 Bengal-gram: 1 GNC: 2 jaggery), Amutham (1.5 ragi: 1.5 wheat: 1.5 Bengal-gram: 2.5 jaggery: 2.5 oil), Amritham (4 wheat: 2 Bengal-gram: 1 oilseed: 1 milk powder: 2 jaggery) — should be remembered as a list of NIN/CFTRI low-cost formulas.

The National Immunisation Schedule (Table 3, p. 157) is the second most-tested table. Birth: BCG (anti-TB), OPV-0 (polio), Hep B-1; 6/10/14 weeks: OPV and PENTA (DPT + Hep B + Hib); 9 months: MR (Measles, Rubella). The booster schedule (Table 6, p. 163) — 15–18 months MMR; 16 months–2 years DPT/OPV booster; 2 years typhoid; 10 and 16 years Tetanus Toxoid — should be paired in memory with the primary schedule.

The six dreaded communicable diseases that immunisation protects against (p. 158) are polio, diphtheria, tuberculosis, pertussis, measles and tetanus — a CUET 'odd-one-out' favourite where typhoid or hepatitis B may be added as distractors. The major child deficiency diseases: Protein-Energy Malnutrition (kwashiorkor and marasmus → growth retardation), Iron Deficiency Anaemia, Vitamin A deficiency (nutritional blindness/xerophthalmia), Vitamin D + calcium deficiency (rickets/osteopenia), and Iodine Deficiency (goitre).

Preschool nutrition (1–6 years) shifts focus from grams per kg to absolute daily intake. The RDA table (Table 4) — 1240 kcal at 1–3 yrs, 1690 kcal at 4–6 yrs; 22 g and 30 g protein respectively; 400 mg calcium; iron 12–18 mg — anchors balanced-diet design. ICMR's balanced-diet quantities for preschoolers (Table 5) translate the RDA into food-group servings: cereals 60–120 g, pulses 30 g, milk 500 ml, vegetables (roots/leafy/others 50–100 g each), fruits 100 g, sugar 15–25 g, fats 20–25 g. The three diet principles (variety, balance, moderation) and the universal iodisation policy (the National Iodine Deficiency Disorders Control Programme mandates iodised salt) close out the preschool section.

School-age nutrition (7–12 years) sees the latent growth period and the late-childhood acceleration toward puberty. The big concept is that nutrient needs are similar for boys and girls until age 9 and then diverge — most strikingly in iron (10–12 yr girls need 27 mg vs 21 mg for boys) in preparation for menarche. Diet planning principles include limiting saturated fat ($\leq 20\%$ of calories), salt and added sugar; never skipping breakfast; and involving children in meal planning — a behavioural-change strategy. Rising childhood obesity, Type II diabetes and hypertension in urban Indian children parallel the broader 'double burden of malnutrition' narrative. The Mid-Day Meal Scheme (since 1995, now PM POSHAN since 2021) covers Classes I–VIII and has documented gains in attendance, learning outcomes, and reduction of gender and caste gaps — a frequent CUET application MCQ.

2.2 Definitions to memorise

Term	Definition	Page
Nutrition	"Food at work" — process by which we obtain and metabolise nutrients for growth, repair and well-being	152
Colostrum	Yellow-coloured fluid produced in the first 2–3 days after birth, very rich in antibodies	154
Low birth weight	Baby weighing less than 2.5 kg at birth	155
Complementary feeding	Process of gradually introducing other foods along with breast milk (by 6 months)	155
Malnutrition	Refers to both undernutrition (lack of nutrients) and overnutrition (excess of nutrients)	169
Obesity	Deposit of excess fat in body causing body weight to rise above normal — intake exceeds energy spent	169
Hypertension	High blood pressure	170
Diabetes	Deficiency of insulin causing rise in blood glucose and presence of glucose in urine	170
BCG	Bacillus Calmette-Guerin (anti-TB vaccine)	157
OPV / DPT / HEP B / HiB	Oral Polio Vaccine / Diphtheria-Pertussis-Tetanus / Hepatitis B / Haemophilus influenza type b	157
PEM	Protein-Energy Malnutrition — kwashiorkor and marasmus	158
Kwashiorkor	PEM with severe protein deficiency; oedema, skin/hair changes	158
Marasmus	PEM with severe calorie deficiency; emaciation	158
Xerophthalmia	Vitamin A deficiency causing eye drying and blindness	158
Rickets	Vitamin D + calcium deficiency in children	158
Goitre	Iodine deficiency causing thyroid enlargement	158
Iodised salt	National strategy to prevent IDD (NIDDCP)	160
Balahar	Indian low-cost weaning food (7:2:2 ratio)	156
Poshak	Indian low-cost weaning food (4:2:1:2 ratio)	156
Amritham	Indian low-cost weaning food (4:2:1:1:2)	156
Indian Multipurpose Flour	75 wheat: 25 Bengal-gram	156
PENTA vaccine	DPT + Hep B + Hib combined	157
MR vaccine	Measles + Rubella (at 9 months)	157
MMR vaccine	Measles + Mumps + Rubella (booster 15–18 months)	163

Term	Definition	Page
Tetanus Toxoid (TT)	School-age booster at 10 and 16 years	163
MDMS / PM POSHAN	Mid-Day Meal Scheme for Classes I–VIII	169
ICDS	Integrated Child Development Services (Anganwadi)	India context
NIN	National Institute of Nutrition (Hyderabad) — ICMR institute publishing RDA	India context

2.3 Diagrams / processes to remember

- Table 1 (p. 154) — RDA for infants 0–6 months vs 6–12 months (energy, protein, calcium, vitamins).
- Table 2 (p. 156) — Types of Complementary Foods (liquid / semi-solid / solid) with introduction ages.
- Table 3 (p. 157) — National Immunisation Schedule (Birth → 9 months).
- Table 4 (p. 159) — RDA for preschoolers 1–3 yrs vs 4–6 yrs.
- Table 5 (p. 161) — ICMR balanced diet for preschoolers.
- Table 6 (p. 163) — Booster immunisation schedule (15–18 months → 16 yrs).
- Table 7 (p. 164) — RDA for school children 7–9 yrs vs 10–12 yrs (boys vs girls).
- Table 8 (p. 166) — ICMR balanced diet quantities for school children.

2.5 Key data / RDA processes table (Indian context, ICMR-NIN)

Item	Value / fact	Source
Infant weight doubles	by 6 months	NCERT p. 153
Infant weight triples	by 1 year	NCERT p. 153
Infant length at birth → 1 year	50–55 cm → 75 cm	NCERT p. 153
Energy RDA 0–6 months	108 kcal/kg	NCERT Table 1
Protein RDA 0–6 months	2.05 g/kg	NCERT Table 1
Calcium RDA 0–6 months	500 mg	NCERT Table 1
Energy RDA 6–12 months	98 kcal/kg	NCERT Table 1

Item	Value / fact	Source
Protein RDA 6–12 months	1.65 g/kg	NCERT Table 1
Exclusive breast-feeding duration (WHO)	6 months (no water)	NCERT p. 154
Low birth weight cut-off	<2.5 kg	NCERT p. 155
Complementary feeding starts	by 6 months	NCERT p. 155
Minimum protein in complementary food	≥ 10% of energy	NCERT p. 156
BCG given at	Birth	NCERT Table 3
OPV-0 and Hep B-1 given at	Birth	NCERT Table 3
PENTA given at	6, 10, 14 weeks	NCERT Table 3
MR (Measles, Rubella) given at	9 months	NCERT Table 3
MMR booster	15–18 months	NCERT Table 6
DPT/OPV booster	16 months–2 years	NCERT Table 6
Typhoid booster	2 years	NCERT Table 6
Tetanus Toxoid booster	10 and 16 years	NCERT Table 6
Preschool 1–3 yrs energy	1240 kcal	NCERT Table 4
Preschool 4–6 yrs energy	1690 kcal	NCERT Table 4
Preschool protein 1–3 / 4–6 yrs	22 g / 30 g	NCERT Table 4
Preschool calcium	400 mg	NCERT Table 4
School age 7–9 yrs energy	1690 kcal	NCERT Table 7
School 10–12 yrs Boys energy	2190 kcal	NCERT Table 7

Item	Value / fact	Source
School 10–12 yrs Girls energy	2010 kcal	NCERT Table 7
School 10–12 yrs Girls iron	27 mg (highest)	NCERT Table 7
School fat cap	≤20% of calories	NCERT p. 165
Physical activity for school children	45–60 min/day	NCERT p. 168
Number of diseases under immunisation	Six (polio, diphtheria, TB, pertussis, measles, tetanus)	NCERT p. 158

2.4 Common confusions / NTA trap points

- WHO recommends exclusive breast feeding for **six months** — water is also NOT required during this period (commonly mis-stated as 4 months).
- Colostrum is produced in first **2–3 days**, not throughout lactation; its key property is **antibodies**, not high calories.
- Complementary foods are introduced **by 6 months** (not 4 months) and must provide **at least 10% energy as protein**.
- At 10–12 years, iron requirement is highest for **girls (27 mg)** — for preparation of menarche — higher than 10–12 yr boys (21 mg).
- MR vaccine (Measles, Rubella) is given at **9 months**; the **MMR** booster (Measles, Mumps, Rubella) is at **15–18 months** — students often confuse the two.
- Goitre is due to **iodine** deficiency; nutritional blindness is **vitamin A**; rickets is **vitamin D + calcium** — pairings often swapped in distractors.
- BCG is given **at birth** — NOT 6 weeks. NTA distractors often swap BCG and PENTA timing.
- The 'six diseases' under UIP exclude typhoid and hepatitis B; the canonical six per NCERT are polio, diphtheria, TB, pertussis, measles, tetanus.
- Iron RDA for 10–12 yr girls (27 mg) is **higher than** for adult women — because of menarche preparation.
- Indian Multipurpose Flour ratio 75:25 (wheat:Bengal gram) — sometimes flipped in distractors.



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Practice MCQs

PYQ Alignment

This chapter is a high-yield source in CUET Home Science, typically supplying ~6–8 MCQs per year — drawn most often from the National Immunisation Schedule (age–vaccine matching), RDA tables for infants/preschool/school-age children, definitions (colostrum, low birth weight, malnutrition, obesity), deficiency-disease pairings, and case-based items on planning balanced meals or healthy habits.



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