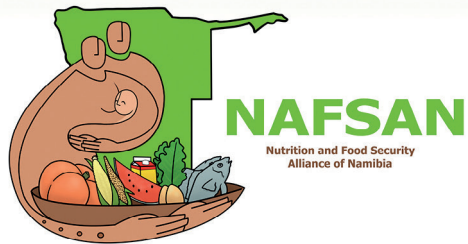


NUTRITION FOR HEALTH

EMBRACING OUR NAMIBIAN FOOD SYSTEMS



Set 3 =
**Right Start
for Children
and Food
Systems**



Right Start
make a child's first steps
the right steps.

www.RightStart.com.na



Supported by
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SLIDE 5.1. - FIRST 1,000 DAYS

- The image of a pregnant woman (**1**) highlights how human development starts in the womb, as embryos already start adapting right after conception to their environment.
- The **first '0'** shows the importance of breastfeeding (6 months exclusively, and continue until 2 years).
- The **second '0'** emphasises the importance of complementary feeding = the first foods in addition to the mother's milk after 6 months, as the child transitions to eating solid food, first with support and later on their own.
- The **third '0'** highlights how nutrition as a central component for development supports children to successfully stand and walk 'on their own' when they are provided with good nutrition, positive stimulation, protection, loving care, empathy, and opportunities for play during these first 2+ years of their life.

SLIDE 5.1. - FIRST 1000 DAYS

Namibian Parent & Care-Giver Support Kit *Slide 2.1.1. – “First 1,000 Days”*

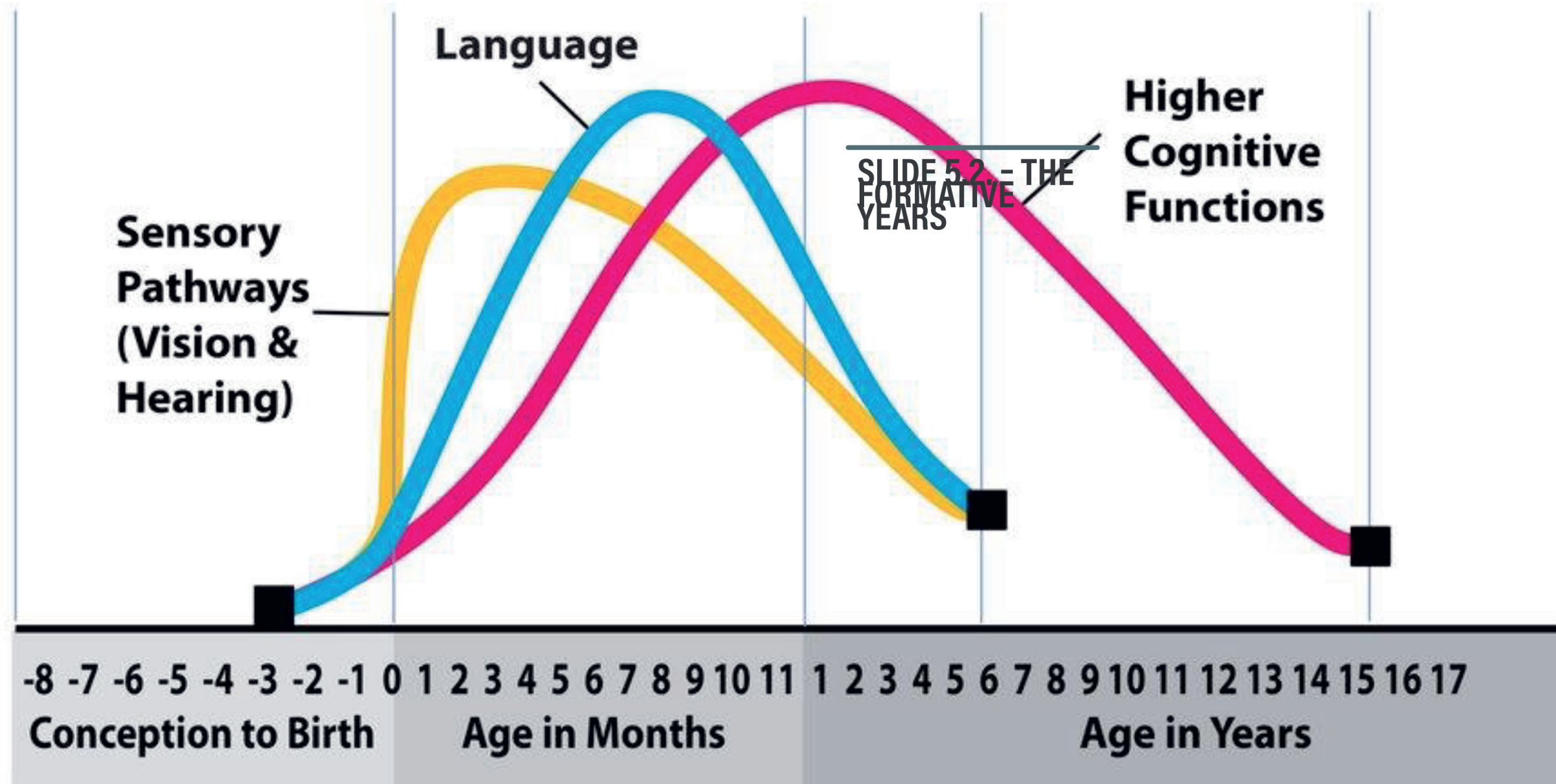


SLIDE 5.2. - THE FORMATIVE YEARS

- The first eight years in the life of a child are called 'the formative years, as these are the key years for our physical, mental (cognitive), emotional, and social development.
- The first 1,000 days = from conception until the age of two (2) years, is when the foundation is built, with nutrition playing a central role in this, for the human brain to develop, as shown on the chart.
- Explain aspects of vision, hearing, language and cognitive development as necessary.

Human Brain Development

Synapse formation is dependent on early experiences



Synapse formation begins declining before Age 3

SLIDE 5.3. - NAMIBIA'S RIGHT START CAMPAIGN

- Integrated Early Childhood Development (IECD) has been recognized as extremely important for Namibia's national development, including aspects of nutrition.
- This is why the Right Start Campaign was established by multiple stakeholders in 2020.
- The campaign's website contains plenty of useful information and documents: www.rightstart.com.na



Right Start

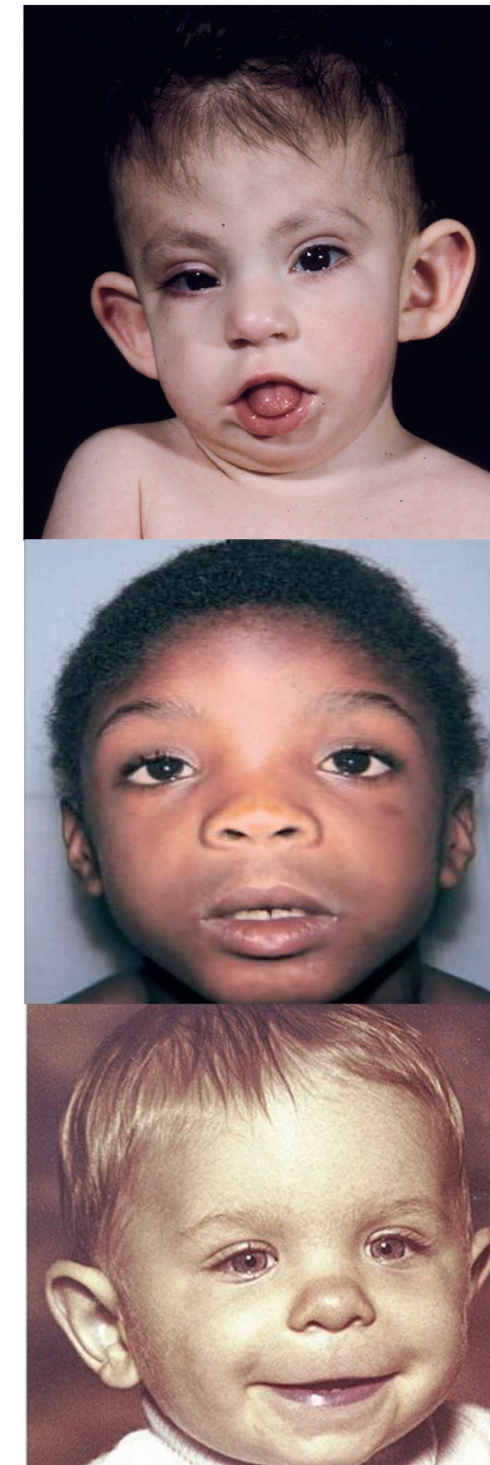
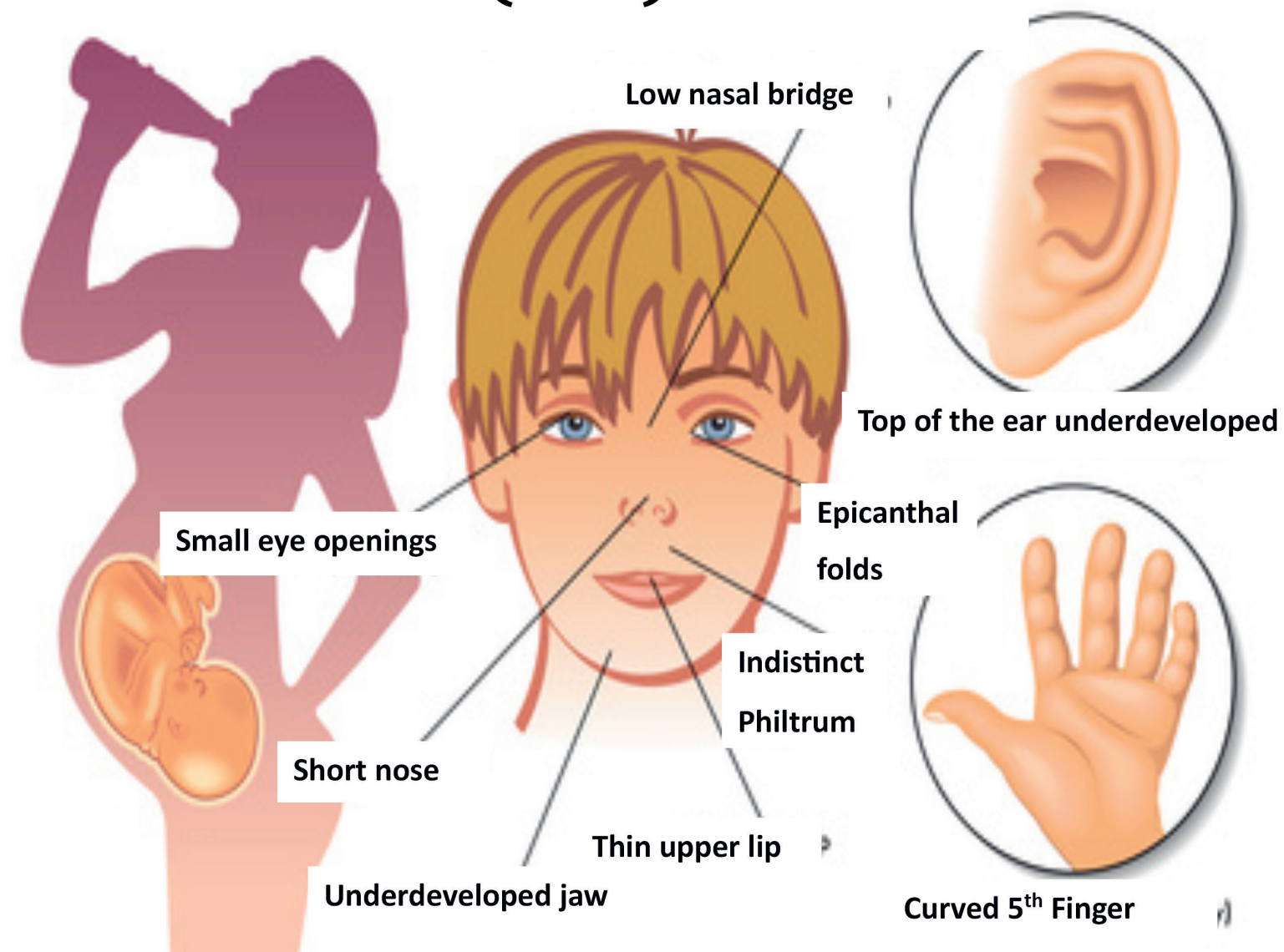
make a child's first steps
the right steps.

www.RightStart.com.na

SLIDE 5.4. - ALCOHOL & SMOKING DURING PREGNANCY

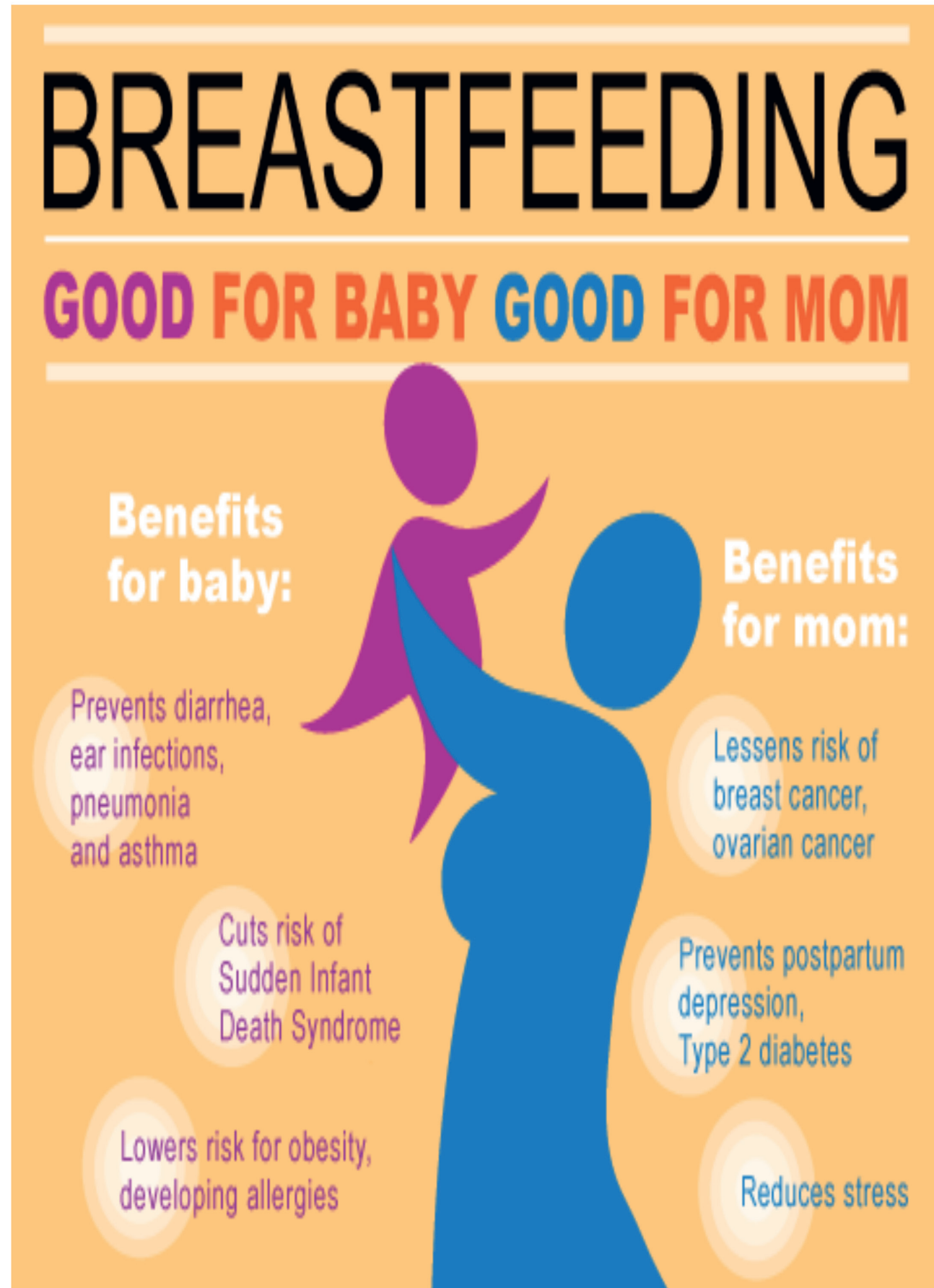
- FAS causes permanent (non-reversible!) physical and cognitive problems for the developing baby
- Babies with FAS may have smaller heads, delayed growth, abnormal facial features, and intellectual problems with learning and memory. It can be devastating, both for the affected child and for their family, and such babies often require specialized care.
- There is no safe amount of alcohol that a pregnant woman can consume, as any amount of alcohol can harm the developing fetus. Pregnant women must avoid drinking alcohol entirely.
- **Smoking during pregnancy** also harms the baby by decreasing the amount of oxygen and nutrients it gets, reducing growth and increasing the risks of various future health problems.
- Pregnant women who smoke have an increased chance of giving birth prematurely, delivering babies with low birth weight, experiencing stillbirth, and having infants who develop sudden infant death syndrome (SIDS).
- Babies born to mothers who smoked during pregnancy are at a greater risk of developing respiratory infections and asthma.

Fetal Alcohol Syndrome (FAS)



SLIDE 5.4. - BENEFITS OF BREASTFEEDING

- Benefits for babies: help protect against infections and diseases, reduce the risk of sudden infant death
- Drink water/tea + different types of breastfeeding positions: cradle hold, cross-cradle hold, side-lying



*Breast milk is the **perfect food** for infants,
= all nutrients needed to grow/develop.*

*Reduces risk of illnesses and infections
- makes your baby **healthy and strong**,
+ Improves infant brain development -
makes your child **smarter**.*



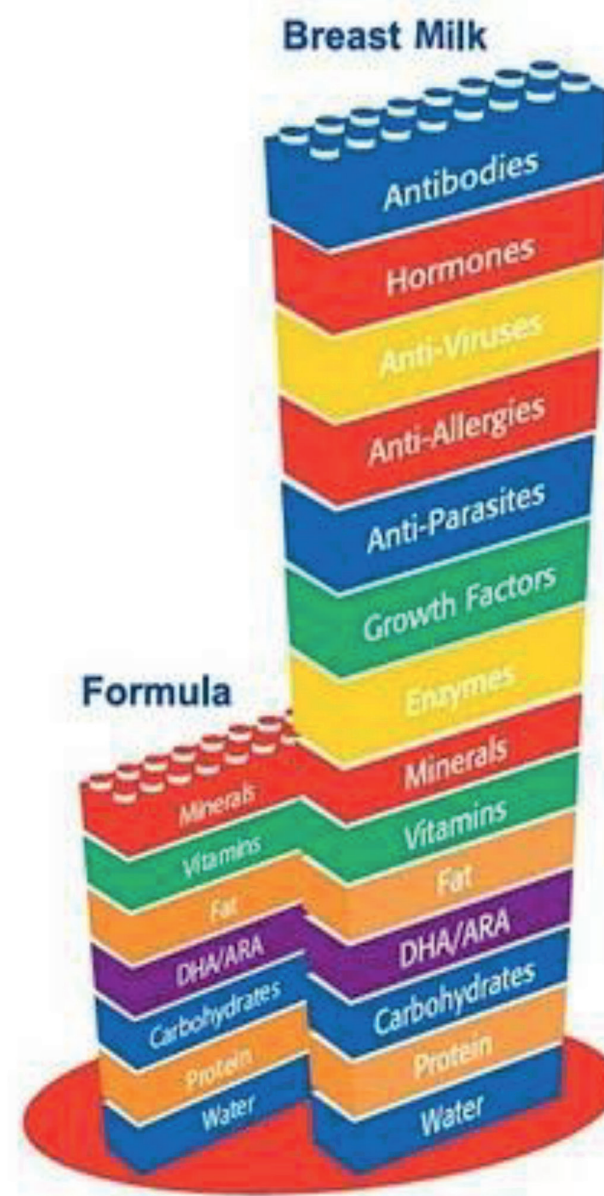
SLIDE 5.6. - 'BREAST IS BEST' VS. FORMULA MILK

- Key components only found in breastmilk: antibodies, hormones, white blood cells, enzymes and more
- Breastfeeding should be promoted, and consumers must be protected from false or misleading marketing or advertising of formula milk as pretending to be as good as or even better than the original breastmilk.
- In some limited cases however, the use of formula can be useful indeed. Yet, in many cases there are ways in which mothers can continue using their own milk, e.g., pumping of milk when having to go to work.

SLIDE 5.6. - 'BREAST IS BEST' VS. FORMULA MILK

Breastmilk vs. Formula

DID YOU EVER WONDER WHAT'S IN... ?



BREASTMILK

WATER

CARBOHYDRATES (energy source)
Lactose
Oligosaccharides (see below)

CARBOXYLIC ACID
Alpha hydroxy acid
Lactic acid

PROTEINS
(building muscles and bones)
Whey protein
Alpha-lactalbumin
HAMLET (Human Alpha-lactalbumin Made Lethal to Tumour cells)
Lactoferrin
Many antimicrobial factors (see below)
Casein
Serum albumin

NON-PROTEIN NITROGENS
Creatine
Creatinine
Urea
Uric acid
Peptides (see below)
Amino Acids (the building blocks of proteins)

Alanine
Arginine
Aspartate
Cysteine
Glutamate
Histidine
Isoleucine
Leucine
Lysine
Methionine
Phenylalanine
Proline
Serine
Taurine
Threonine
Tryptophan
Tyrosine
Valine
Carnitine (amino acid compound necessary to make use of fatty acids as an energy source)
Nucleotides (chemical compounds that are the structural units of RNA and DNA)
5'-Adenosine monophosphate (5'-AMP)
3'-5'-cyclic adenosine monophosphate (3'-5'-cyclic AMP)
5'-Cytidine monophosphate (5'-CMP)
Cytidine diphosphate choline (CDP choline)
Guanosine diphosphate (UDP)
Guanosine diphosphate - mannose
3'-Uridine monophosphate (3'-UMP)
5'-Uridine monophosphate (5'-UMP)
Uridine diphosphate (UDP)
Uridine diphosphate hexose (UDPH)
Uridine diphosphate-N-acetylhexosamine (UDPAH)
Uridine diphosphoglucuronic acid (UDPGA)
Several more novel nucleotides of the UDP type

FATS

Triglycerides
Long-chain polyunsaturated fatty acids
Docosahexaenoic acid (DHA) (important for brain development)
Arachidonic acid (AHA) (important for brain development)
Alpha-linolenic acid (ALA)
Eicosapentaenoic acid (EPA)
Conjugated linoleic acid (Rumenic acid)
Free Fatty Acids
Monounsaturated fatty acids
Oleic acid
Palmitoleic acid
Heptadecenoic acid
Saturated fatty acids
Stearic
Palmitic acid
Lauric acid
Myristic acid
Phospholipids
Phosphatidylcholine
Phosphatidylethanolamine
Phosphatidylinositol
Lysophosphatidylcholine
Lysophosphatidylethanolamine
Plasmalogens
Sphingolipids
Sphingomyelin
Gangliosides
GM1
GM2
GM3
Glucosylceramide
Glycosphingolipids
Galactosylceramide
Lactosylceramide
Globotriaosylceramide (GB3)
Globoside (GB4)
Sterols
Squalene
Lanosterol
Dimethylsterol
Melhosterol
Lathosterol
Desmosterol
Triacylglycerol
Cholesterol
7-dehydrocholesterol
Stigma-and campesterol
7-ketcholesterol
Sitosterol
β-lathosterol
Vitamin D metabolites
Steroid hormones

VITAMINS

Vitamin A
Beta carotene
Vitamin B6
Vitamin B8 (Inositol)
Vitamin B12
Vitamin C
Vitamin D
Vitamin E
α-Tocopherol
Vitamin K
Thiamine
Riboflavin
Niacin
Folic acid
Pantothenic acid
Biotin

MINERALS

Calcium
Sodium
Potassium
Iron
Zinc
Chloride
Phosphorus
Magnesium
Copper
Manganese
Iodine
Selenium
Choline
Sulphur
Chromium
Cobalt
Fluorine
Nickel

METAL

Molybdenum (essential element in many enzymes)

GROWTH FACTORS

(aid in the maturation of the intestinal lining)
Cytokines
Interleukin-1β (IL-1β)
IL-2
IL-4
IL-6
IL-8
IL-10
Granulocyte-colony stimulating factor (G-CSF)
Macrophage-colony stimulating factor (M-CSF)
Platelet derived growth factor (PDGF)
Vascular endothelial growth factor (VEGF)
Hepatocyte growth factor-α (HGF-α)
HGF-β
Tumor necrosis factor-α
Interferon-γ
Epithelial growth factor (EGF)
Transforming growth factor-α (TGF-α)
TGF-β1
TGF-β2
Insulin-like growth factor-I (IGF-I) (also known as somatomedin C)
Insulin-like growth factor- II
Nerve growth factor (NGF)
Erythropoietin

PEPTIDES

(combinations of amino acids)
HMGF I (Human growth factor)
HMGF II
HMGF III
Cholecystokinin (CCK)
β-endorphins
Parathyroid hormone (PTH)
Parathyroid hormone-related peptide (PTHrP)
β-defensin-1
Calcitonin
Gastrin
Motilin
Bombesin (gastric releasing peptide, also known as neuromedin B)
Neurotensin
Somatostatin

HORMONES

(chemical messengers that carry signals from one cell, or group of cells, to another via the blood)
Cortisol
Triiodothyronine (T3)
Thyroxine (T4)
Thyroid stimulating hormone (TSH) (also known as thyrotropin)
Thyroid releasing hormone (TRH)
Prolactin
Oxytocin
Insulin
Corticosterone
Thrombopoietin
Gonadotropin-releasing hormone (GnRH)
GRH
Leptin (aids in regulation of food intake)
Ghrelin (aids in regulation of food intake)
Adiponectin
Feedback inhibitor of lactation (FIL)
Eicosanoids
Prostaglandins (enzymatically derived from fatty acids)
PG-E1
PG-E2
PG-F2
Leukotrienes
Thromboxanes
Prostacyclins

ENZYMES

(catalysts that support chemical reactions in the body)
Amylase
Arylsulfatase
Catalase
Histaminase
Lipase
Lysozyme
PAF-acetylhydrolase
Phosphatase
Xanthine oxidase

ANTIPROTEASES

(thought to bind themselves to macromolecules such as enzymes and as a result prevent allergic and anaphylactic reactions)
a-1-antitrypsin
a-1-antichymotrypsin

ANTIMICROBIAL FACTORS
(are used by the immune system to identify and neutralize foreign objects, such as bacteria and viruses.)
Leukocytes (white blood cells)
Phagocytes
Basophils
Neutrophils
Eosinophils
Macrophages
Lymphocytes
B lymphocytes (also known as B cells)
T lymphocytes (also known as C cells)
sIgA (Secretory immunoglobulin A) (the most important antineoplastic factor)

Complement C1
Complement C2
Complement C3
Complement C4
Complement C5
Complement C6
Complement C7
Complement C8
Complement C9
Glycoproteins
Mucins (attaches to bacteria and viruses to prevent them from clinging to mucosal tissues)
Lactadherin
Alpha-lactoglobulin
Alpha-2 macroglobulin
Lewis antigens
Ribonuclease
Haemagglutinin inhibitors
Bifidus factor (increases growth of Lactobacillus bifidus - which is a good bacteria)
Lactoferrin (binds to iron which prevents harmful bacteria from using the iron to grow)
Lactoperoxidase
B12 binding protein (deprives microorganisms of vitamin B12)
Fibronectin (makes phagocytes more aggressive, minimizes inflammation, and repairs damage caused by inflammation)
Oligosaccharides (more than 200 different kinds)

FORMULA

WATER

CARBOHYDRATES
Lactose
Corn maltodextrin

PROTEIN

Partially hydrolyzed reduced minerals whey protein concentrate (from cow's milk)

FATS

Palm olein
Soybean oil
Coconut oil
High oleic safflower oil (or sunflower oil)
M. alpina oil (Fungal DHA)
C.ohnii oil (Algal ARA)

MINERALS

Potassium citrate
Potassium phosphate
Calcium chloride
Tricalcium phosphate
Sodium citrate
Magnesium chloride
Ferrous sulphate
Zinc sulphate
Sodium chloride
Copper sulphate
Potassium iodide
Manganese sulphate
Sodium selenate

VITAMINS

Sodium ascorbate
Inositol
Choline bitartrate
Alpha-Tocopheryl acetate
Niacinamide
Calcium pantothenate
Riboflavin
Vitamin A acetate
Pyridoxine hydrochloride
Thiamine mononitrate
Folic acid
Phylloquinone
Biotin
Vitamin D3
Vitamin B12

ENZYME

Trypsin

AMINO ACID

Taurine
L-Carnitine (a combination of two different amino acids)

NUCLEOTIDES

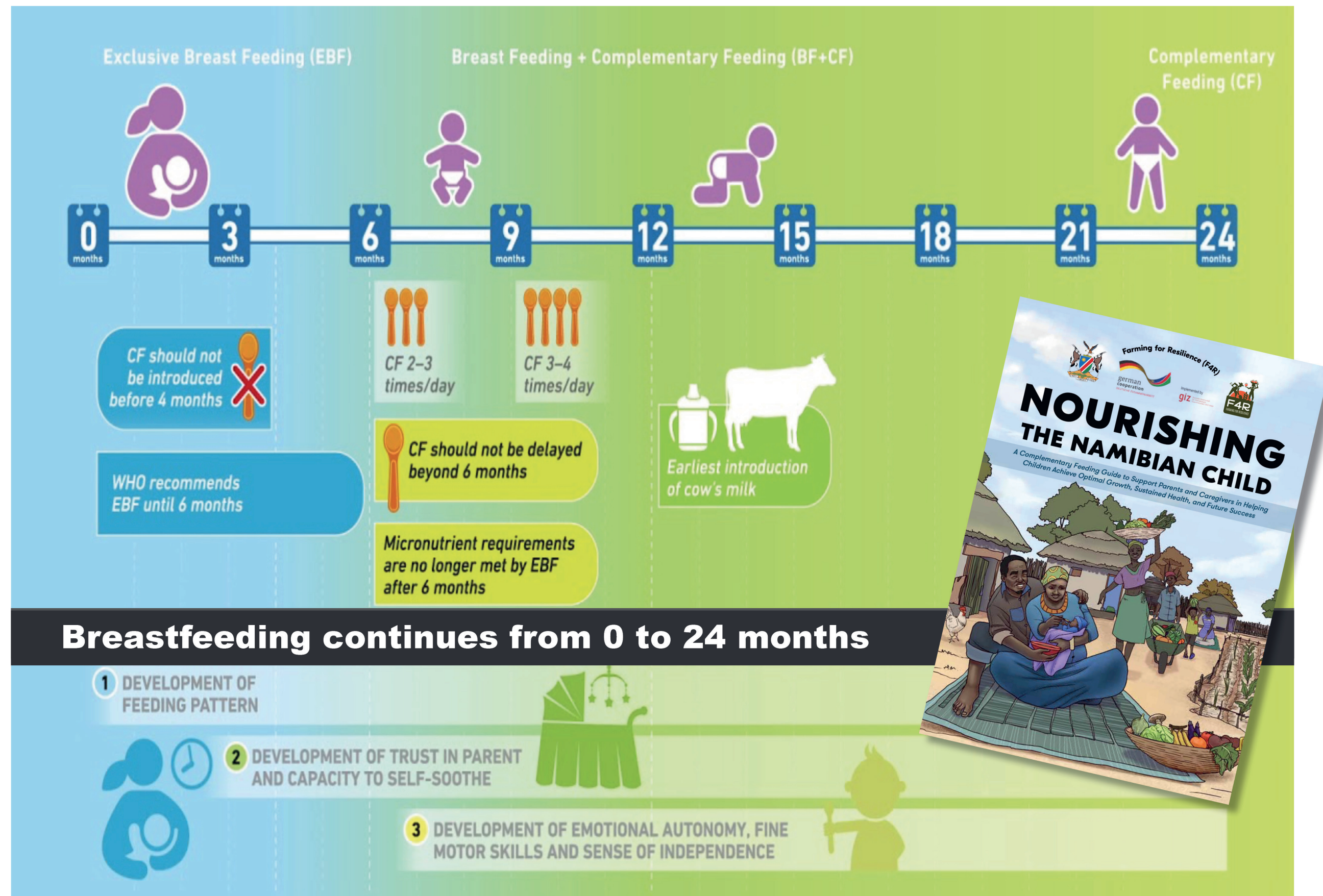
Cytidine 5-monophosphate
Disodium uridine 5-monophosphate
Adenosine 5-monophosphate
Disodium guanosine 5-monophosphate
Soy Lecithin



SLIDE 5.7. - COMPLEMENTARY FEEDING: TIPS AND BEST PRACTICES

- Complementary feeding (= slowly introducing a variety of food) should start at 6 (six) months while mothers still continue breastfeeding until the child is 2 (two) years old. Some parents start complementary feeding at four months already, yet it should not be delayed beyond 6 (six) months.
- Benefits of complementary feeding: build strong immune system, support growth and proper development
- Type of food to be eaten during the complementary phase (start with iron-fortified infant cereal – thin mahangu and oats and gradually introduce family food – mashed bananas, carrots, pumpkin, fish, chicken
- Nourishing the Namibian Child – offers practical advice and recipes, and one can download it here: <https://cloud.nafsan.org/ChildNutrition.pdf>
- No sugar and no salt – to reduce the risk of developing health problems such as diabetes and hypertension later on in life. It also helps to limit the child from developing a sweet tooth and salty cravings.

SLIDE 5.7 - FIRST FOODS (COMPLEMENTARY FEEDING): TIPS AND BEST PRACTICES



SLIDE 6.1. - IMPORTANCE OF HEALTHY EATING FOR KIDS

- Children need to eat and drink healthy for proper growth, better immune systems, and smarter brains
- Healthy eating and drinking habits are formed at an early age. Avoid giving them too much sugar early on, and role-model healthy eating and drinking habits, as well as other positive behaviours.
- Besides good nutrition, let children play and explore in safe environments. Caregivers who interact with their children, stimulate growth and brain development. Loving and healthy Early Childhood Development is key to their future success in life.
- **Caution:** Limit young children's exposure to electronics, such as phones, laptops and television. Too early exposure negatively affects long-term health, social skills, behaviour and school performance.

SLIDE 6.1. - IMPORTANCE OF HEALTHY EATING FOR KIDS



SLIDE 6.2. - EARLY EATING PRACTICES AND HABITS

- State how your choices for your children determine their future health and lifestyle.
- Provide and ask for examples of unhealthy eating/drinking practices and their consequences.
- Encourage practicing healthy eating habits from an earlier age. Give and ask for positive examples.



Choices --> Practices --> Habits --> Lifestyle

SLIDE 6.3. - MICRONUTRIENT SUPPLEMENTATION: VITAMIN A + IRON

- Encourage mothers (and fathers!) to take their children to health facilities for regular check-ups for immunization, micro-nutrient supplementation
- Micro-nutrient supplementation that children under five in Namibia need are Vitamin A and Iron, according to national guidelines. Other supplements can include zinc, iodine, and folic acid. Regular de-worming should also be considered, as parasites are common and hinder nutrient intake.
- Health professionals should also measure weight, height and overall growth and make notes in the child's health passport and growth charts. Parents might have to remind nurses of this.

Micronutrient Supplementation: Vitamin A, Zinc, Folic Acid, Iron, Iodine



SLIDE 6.4. - HYGIENE ROUTINES (= NUTRITION-SENSITIVE)

- Ask participants what hygiene routines they have in place at home, such as cleaning, washing hands, brushing teeth, bathing etc.
- Highlight how hygienic, safe and clean conditions are important for us to be and stay healthy.

SLIDE 6.4. - HYGIENE ROUTINES (= NUTRITION-SENSITIVE)



SLIDE 6.5. - LUNCH BOXES AND SCHOOL MEALS

- Ask participants: “What does your child eat at school?” and listen to some responses, which will vary depending on the area and group you are working with.
- Discuss various options for healthy lunch/snacks while children are at school, depending on parents’ and children’s situation and overall circumstances.



SLIDE 7.1 - WHAT ARE FOOD-BORNE ILLNESSES?

- Food-borne illnesses happen through food or drinks contaminated with bacteria, viruses, or parasites
- Toxins or chemicals through contaminated water, soil, air, or through unsafe food storage/processing
- Symptoms can be mild or severe, including diarrhea, vomiting, fever, and even lead to cancer
- Commonly known examples of food-borne illness: Hepatitis A, Listeriosis and Salmonellosis
- We are also going to learn how to prevent food-borne illnesses, e.g. by keeping food cool enough, cooking it properly, washing our hands and the food we eat.

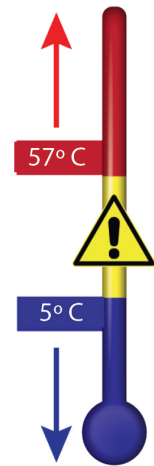
SLIDE 7.1 - WHAT ARE FOOD-BORNE ILLNESSES?



SLIDES 7.2 A) - TRANSMISSION AND INFECTION: HOW DO WE GET THEM?

- Sources of foodborne illness are most often contaminated water, food that has gone bad, infections from unclean hands or equipment, or when using the same cutting board for meat and for vegetables.

Leading Causes of Foodborne Illness



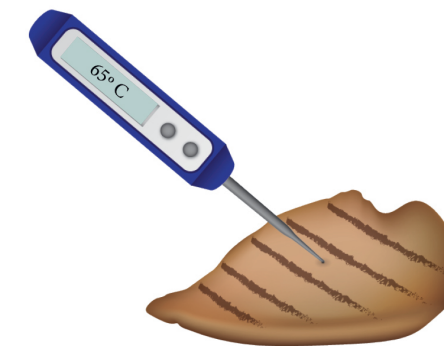
Not keeping food hot (57 °C or above) or cold (5 °C or below) enough



Sick food workers.



Not cleaning or sanitizing equipment.



Not cooking food adequately.



Not using safe (commercial) food sources.



Improperly cooling food.



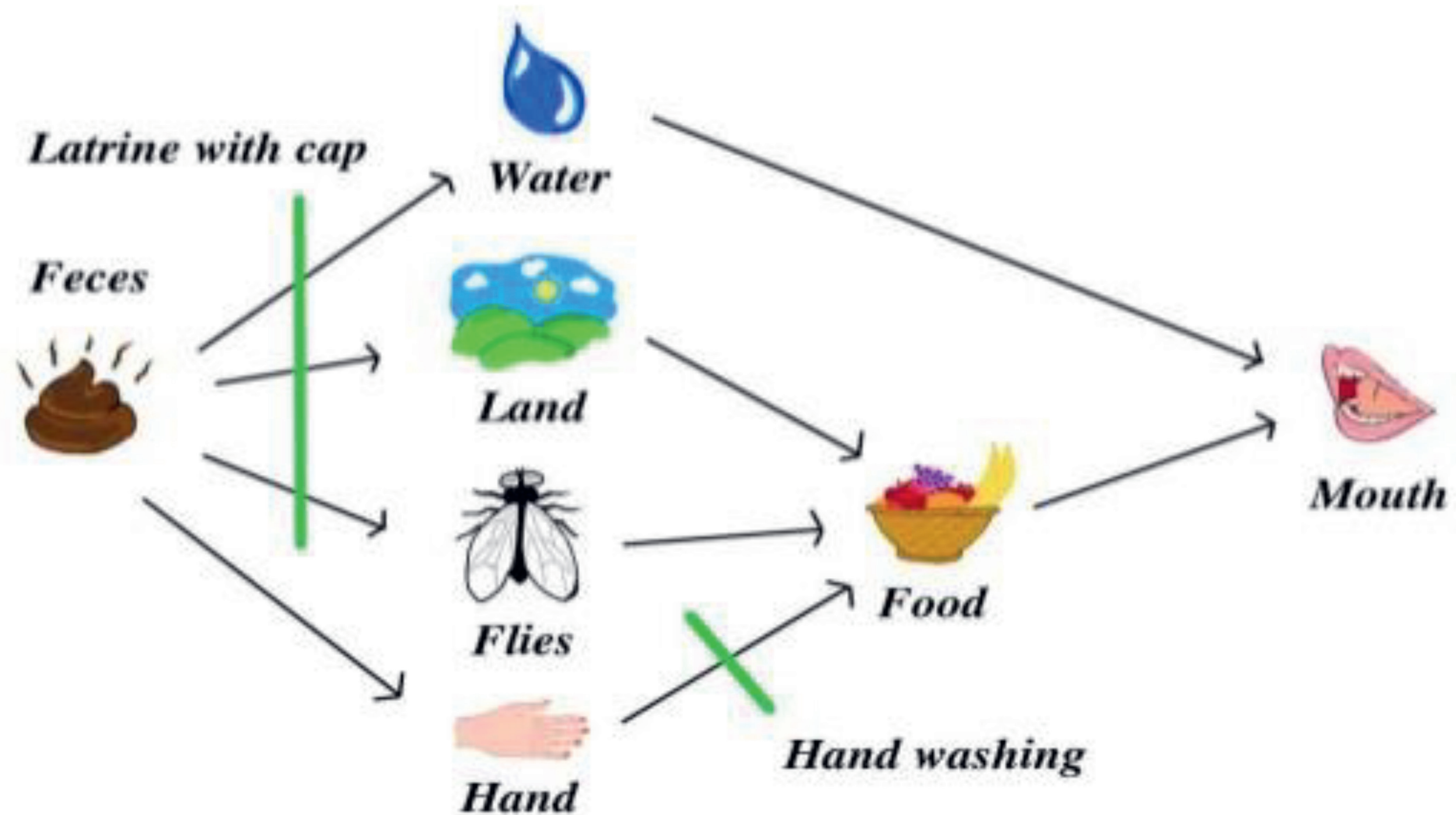
Bare hand contact with ready-to-eat food.



Improper handwashing.

- Infectious diseases often occur using the faecal oral route:
faeces --> flies --> food --> mouth
- It can also happen when watering plants (where the edible part is not under the surface) with water that was contaminated by human sewage/faeces or with animal manure.

Fecal Oral Route

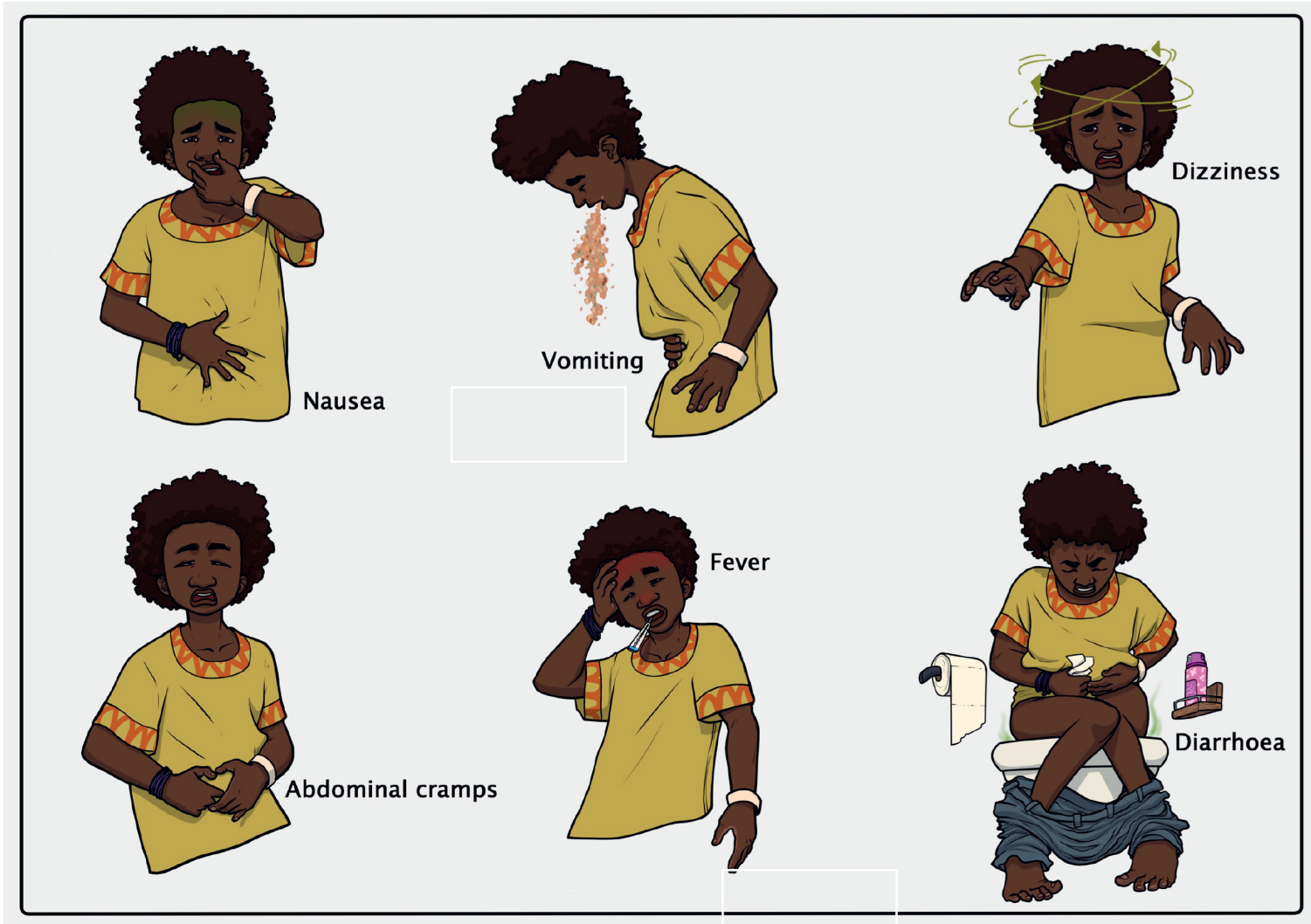


SLIDE 7.3 - SYMPTOMS: HOW TO NOTICE FOOD-BORNE ILLNESSES?

- Short-term symptoms: nausea, diarrhea, vomiting, cramps, headache, fever, muscle weakness etc.
- One of the main dangers hereby are dehydration, internal bleeding, and extremely high fever
- Possible long-term symptoms: cancer, kidney failure or even death

SLIDE 7.3 - SYMPTOMS: HOW TO NOTICE FOOD-BORNE ILLNESSES?

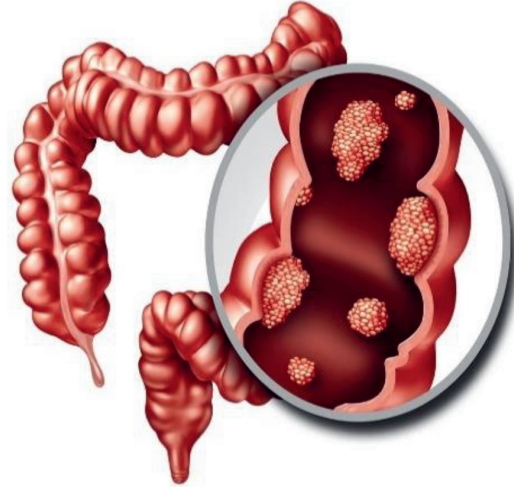
Short-term Symptoms



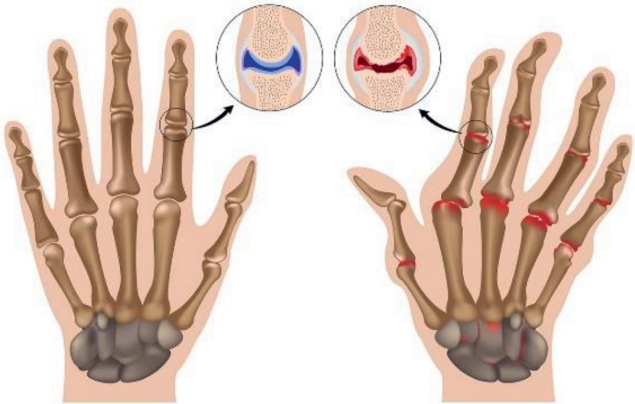
Long-term Symptoms



Kidney Failure



Colon Cancer



Normal

Rheumatoid Arthritis

Chronic Arthritis

SLIDE 7.4 - RESPONSES: WHAT TO DO WHEN YOU GET THEM?

- First aid: drink lots of water, get proper rest, eat light food like bananas, apples, crackers, bread, rice
- What to avoid: alcohol, fried, fatty or spicy foods, meat, eggs, milk products, coffee and smoking
- Severe symptoms = see a doctor: bloody diarrhea or diarrhea for more than 3 days, frequent vomiting, signs of dehydration (no/little urine, dry mouth/throat, dizziness), fever is high (39°C+) or lasts 3+ nights
- Canned food should be taken out of the can immediately after opening.

What to do when you have FOOD POISONING



FIRST AID FOR FOOD POISONING:

- ◇ Avoid solid foods till vomiting stops
- ◇ After vomiting stops, eat light, bland foods like rice, bananas.
- ◇ Drink clear fluids, starting with small sips
- ◇ Don't have greasy, spicy, fried or sweet foods

Go to a Doctor / Clinic / Hospital, if:

- o High fever (over 39°C), or fever for more than 2-3 days/nights.
- o Frequent vomiting (as it prevents keeping liquids in)
- o Diarrhea with blood, or lasting longer than 3 days.
- o Signs of severe dehydration: little or no urination, very dry mouth or throat, feeling dizzy when standing up. + Drink clean water & home-made ORS

- Five Keys to Safer Food:
 - 1 - Keep clean,
 - 2 - Separate raw and cooked food,
 - 3 - Cook food thoroughly (while not overcooking),
 - 4 - Keep at safe temperature,
 - 5 - Use safe water and raw materials
- See 'Background Information'
- Ways to make water safer: boiling, filtering, and using charcoal

SLIDE 7.5 - PREVENTION: HOW TO PROTECT OURSELVES AND OTHERS?

Five keys to safer food



Keep clean

- ✓ Wash your hands before handling food and often during food preparation
- ✓ Wash your hands after going to the toilet
- ✓ Wash and sanitize all surfaces and equipment used for food preparation
- ✓ Protect kitchen areas and food from insects, pests and other animals

Why?

While most micro organisms do not cause disease, dangerous micro organisms are widely found in soil, water, animals and people. These micro organisms are carried on hands, wiping cloths and utensils, especially cutting boards and the slightest contact can transfer them to food and cause foodborne diseases.



Cook thoroughly

- ✓ Cook food thoroughly, especially meat, poultry, eggs and seafood
- ✓ Bring foods like soups and stews to boiling to make sure that they have reached 70°C. For meat and poultry, make sure that juices are clear, not pink. Ideally, use a thermometer
- ✓ Reheat cooked food thoroughly

Why?

Proper cooking kills almost all dangerous micro organisms. Studies have shown that cooking food to a temperature of 70°C can help ensure it is safe for consumption. Foods that require special attention include minced meats, roast meat, large joints of meat and whole poultry.

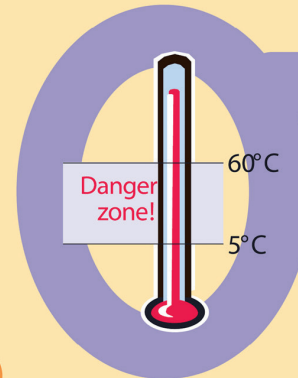


Separate raw and cooked

- ✓ Separate raw meat, poultry and seafood from other foods
- ✓ Use separate equipment and utensils such as knives and cutting boards for handling raw foods
- ✓ Store food in containers to avoid contact between raw and prepared foods

Why?

Raw food, especially meat, poultry and seafood, and their juices, can contain dangerous micro organisms which may be transferred onto other foods during food preparation and storage.



Keep food at safe temperatures

- ✓ Do not leave cooked food at room temperature for more than 2 hours
- ✓ Refrigerate promptly all cooked and perishable food (preferably below 5°C)
- ✓ Keep cooked food piping hot (more than 60°C) prior to serving
- ✓ Do not store food too long even in the refrigerator
- ✓ Do not thaw frozen food at room temperature

Why?

Micro organisms can multiply very quickly if food is stored at room temperature. By holding at temperatures below 5°C or above 60°C, the growth of micro organisms is slowed down or stopped. Some dangerous micro organisms still grow below 5°C.



Use safe water and raw materials

- ✓ Use safe water or treat it to make it safe
- ✓ Select fresh and wholesome foods
- ✓ Choose foods processed for safety, such as pasteurized milk
- ✓ Wash fruits and vegetables, especially if eaten raw
- ✓ Do not use food beyond its expiry date

Why?

Raw materials, including water and ice, maybe contaminated with dangerous micro organisms and chemicals. Toxic chemicals may be formed in damaged and mouldy foods. Care in selection of raw materials and simple measures such as washing and peeling may reduce the risk.

- Healthy food preparation methods: steaming, boiling, baking, grilling etc.
- Tips - Cook vegetables in as little water and not too long to preserve Vitamins C + Bs (water-soluble)
- When cooking, use:
 - Sugar = not at all or as little as possible
 - Oil = sparingly (not too much!) + use healthy oils: marula, olive, coconut
 - Salt = just a moderate amount. Consider using a variety of herbs and spices (such as parsley, turmeric, curcuma, curry etc.) for adding flavour rather than relying on salt alone,.

Healthy Food Preparation Methods



Steaming



Baking/Roasting



Boiling



Poaching



Sautéing



Grilling

SLIDE 8.1 - TRADITIONAL WAYS TO CONSERVE FOOD

- Traditional methods:
drying, salting, smoking, fermenting, sugaring, jellying, pickling

Traditional Ways



Drying



Smoking



Salting



Jellying / Jam



Sugaring



Fermenting & Pickling

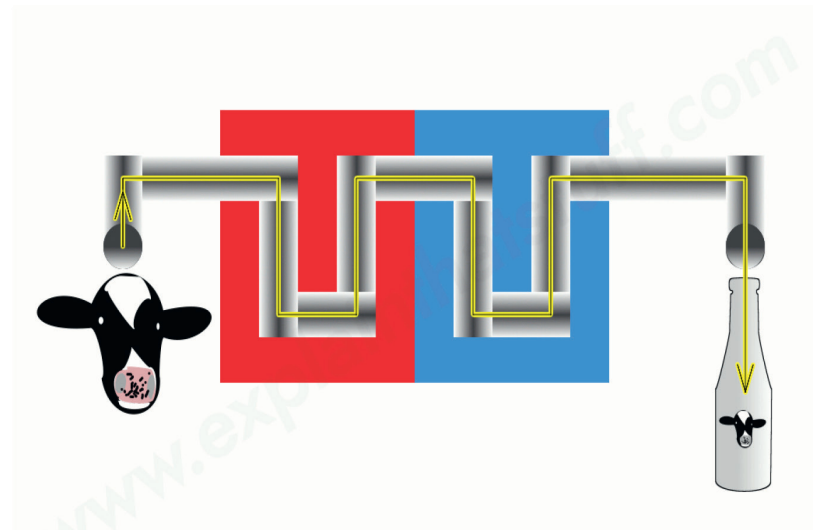
SLIDE 8.2 - MODERN PRESERVATION METHODS AND TECHNIQUES

- Modern methods of food preservation: canning, bottling, vacuuming, freezing, sterilization, pasteurization, chemicals, and irradiation

Modern Techniques



Canning



Pasteurization



Sterilization



Freeze drying



Vacuum Packing



Preservatives

SLIDE 8.3 - FOOD STORAGE TIPS

- Different old and new methods of food storage: grain storage hut, pantry, fridge, freezer
- Food storage tips: store your dry food (pasta, sugar, rice) in a cool dry place
- Easily perishable food (meat, fish, milk products, fresh fruits/vegetables) to be stored cool + covered

Food Storage Methods



Grain Storage Hut



Milk Gourd



Woven Sack



Pantry



Fridge



Air Tight Containers

- Some of our food waste can become fertile soil through composting.
- This can be a simple pit compost (= hole in the ground) that is being fed regularly with organic materials (as shown on the poster) and occasionally watered.



