Infant Feeding and Formulas

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Feeding Infant

- Infants have the ability to regulate their food intake relative to their nutritional needs
- In doing so, they express signs of hunger and satiety and expect their caregiver to respond to these cues

A Useful Guide to the Different Types of Babies


BIG.


SMALL.


BORN WITH TEETH


BORN WITHOUT


LONG.


SHORT.


UPSIDE DOWN.


SIDEWAYS.

TWINS.


ANGRY.


VERY ANGRY.


HUNGRY.


NOT HUNGRY.


MECKEL'S DIVERTICULUM


SMUG.

Hunger and Satiety clues:

Hunger:

- Wake and toss
- Suck on a fist
- Cry or fuss
- Appear like he or she is going to cry

Satiety:

- Sealing the lips together
- A decrease in sucking
- Spitting out the nipple
- Turning away from the breast or bottle

Caregivers should respond to the early signs of hunger and not wait until the infant is upset and crying from hunger

A caregiver should never force an infant to finish what is in the bottle

Infants are the best judge of how much they need

Feeding Frequency and Amount

- As often as exclusively breastfed infants are fed for a total of 8 to 12 feedings within 24 hours
- Young infants need to be fed small amounts of infant formula often throughout the day and night because their stomachs cannot hold a large quantity
- If a newborn infant sleeps longer than 4 hours at a time, the infant should be awakened and offered a bottle

Sleepy Infant

To assure that such infants obtain sufficient nourishment, it is advisable for mothers to wait no more than 4 hours

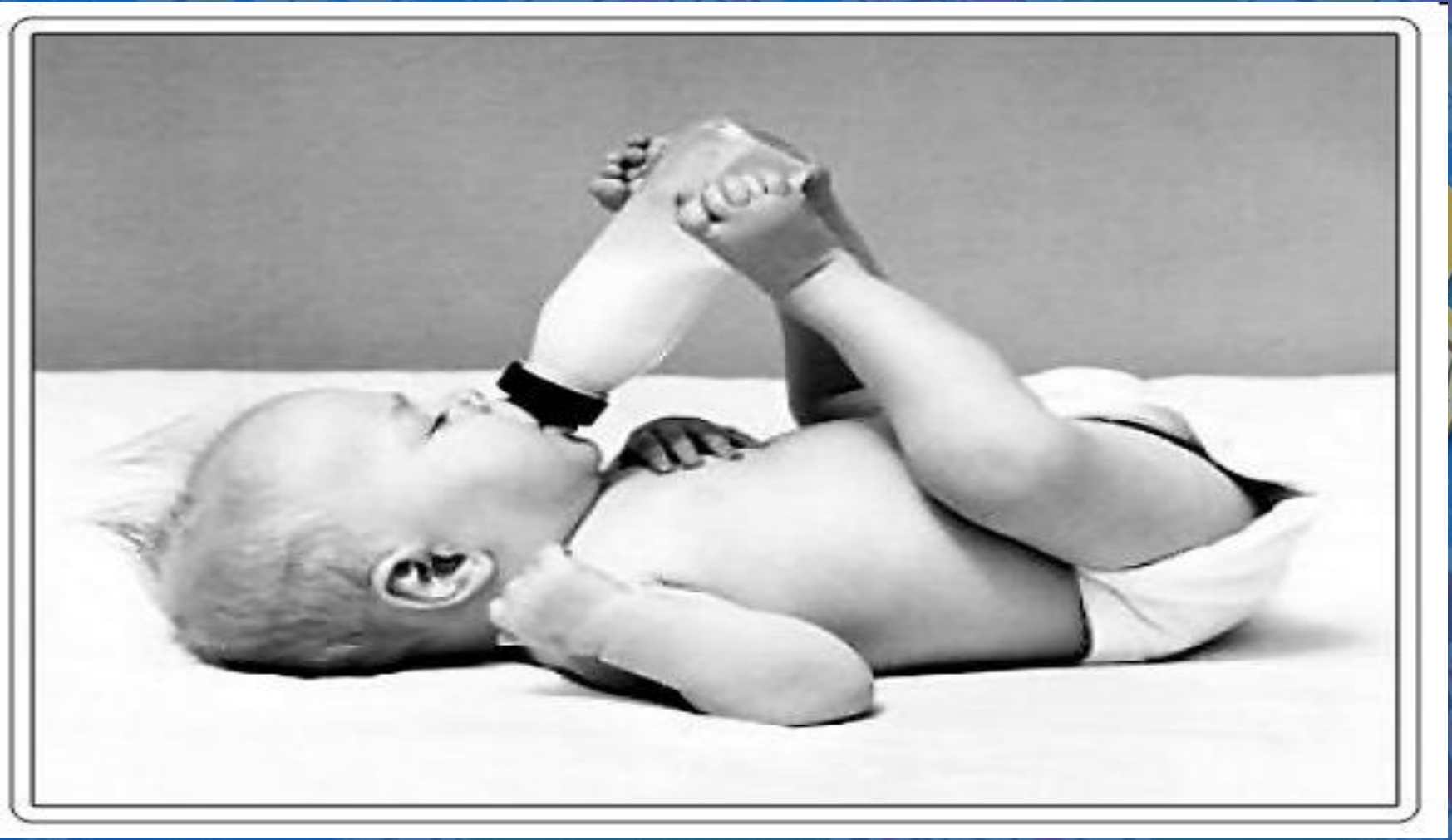
Waking-up a sleepy infant:

- Rubbing or stroking the infant's hands and feet
- Unwrapping or loosening blankets
- Giving the infant a gentle massage
- Undressing or changing the infant's clothing or diaper
- Playing with and talking to the infant

Formula Feeding Tips

- Find a comfortable place in the home for feeding
- Interact with the infant in a calm and relaxed manner in preparation for and during feeding
- Show the infant lots of love, attention, and cuddling in addition to feeding

Guidelines on Feeding From a Bottle



- Wash hands with soap and water before feeding
- Hold the infant in your arms or lap during the feeding (with the infant in a semi-upright position with the head tilted slightly forward, slightly higher than the rest of the body, and supported by the person feeding the infant)
- The infant should be able to look at the caregiver's face

- Hold the bottle still and at an angle so that the end of the bottle near the nipple is filled with infant formula and not air

- Ensure that the infant formula flows from the bottle properly by checking if the nipple hole is an appropriate size

- Burp the infant at any natural break in or at the end of a feeding to eliminate swallowed air from the stomach

"THAT LITTLE FELLA HAS QUITE A BURP ON HIM!"

Breastfeeding is the physiologic norm for mammalian mothers and babies

Breast milk is the optimal source of nutrition for the infant

Types of infant formulas

1. Cow's milk or Soya-based infant formulas (iron-fortified)
2. Hypoallergenic infant formulas
3. Other infant formulas designed to meet the nutritional needs of infants with a variety of dietary needs (e.g., lactose-free,..)

Milk-Based Infant Formula

1. Most commonly consumed
2. Made by modification of cow's milk with added vegetable oils, and vitamins and minerals
3. Modified the protein to simulate the breast milk
4. In milk-based infant formulas:

- protein provide 9 % of calories
- fat provide 48–50 %
- CHO provide 40–45 %

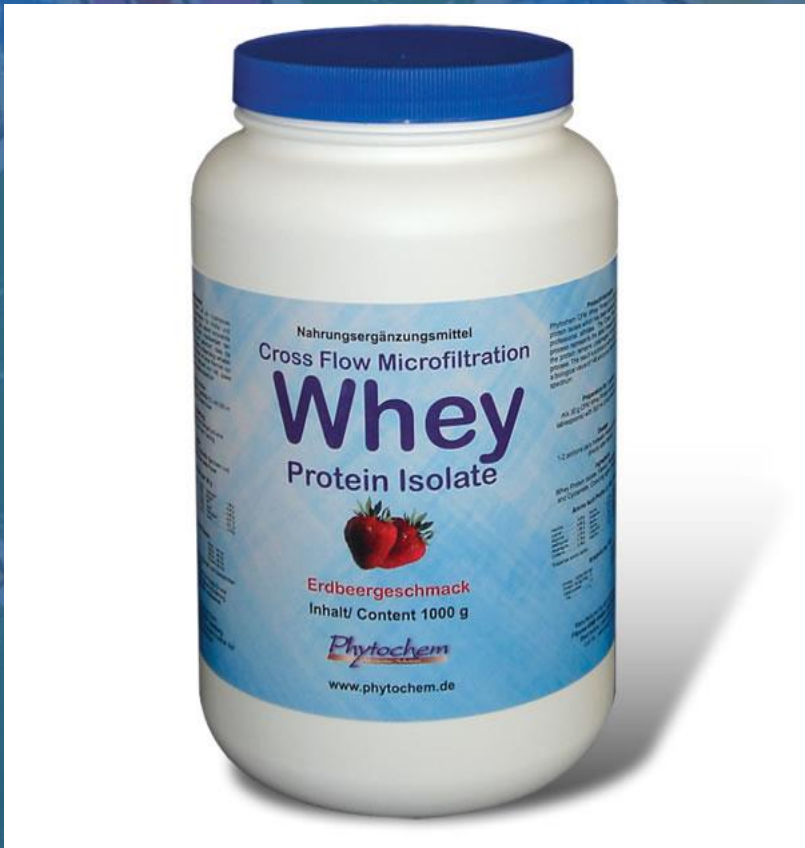
These infant formulas are lower in fat and higher in carbohydrate, protein, and minerals than breast milk

Whey : Casein ratio

- Breast milk 60 : 40
- Cow's milk 20 : 80

Human milk contains lower casein content and is easier to digest

Infant formula contains heat treated cow's milk proteins which results in smaller curds than pasteurized milk



Iron-Fortified Infant Formula

Iron-fortified cow's milk-based infant formula is the most appropriate milk feeding from birth to 12 months for infants who are not breastfed or who are partially breastfed

- Providing non-iron fortified infant formula and cereal reduced ID, is associated with poor cognitive performance and development in infants
- Indication: normal, healthy infants
- Examples: Enfamil, Similac, S-26, Saha

“Starter” Vs “Follow-on” formula

Starter:

Healthy infants < 6mo.

Follow-on:

Healthy infants 6-12 mo.

Slightly higher protein

Slightly higher Ca, Fe

There is no nutritional advantage for switching between

Whey Dominant Vs Casein Dominant

- No nutritional difference
- Whey-Based: Easily digested – less solute load
- Casein-based: Curding

Formulas with added thickening agents:

- AR
- Added rice starch, carob bean flour or corn-starch
- Limitations:
  - contribute to allergy
  - affect gastric emptying
  - one degree of thickness

Soy-Based Infant Formula

Contain:

- Soy protein isolate
- Vegetable oils as the fat source
- Carbohydrate (usually sucrose and/ or corn syrup solids), and vitamins and minerals

Fortified with methionine, and iron

Examples: ProSobee, Isomil SF

Soy-based infant formulas are safe and effective alternatives to cow's milk-based infant formulas, but have no advantage over them

Soy-based infant formulas may be indicated in the following situations:

- Galactosemia or hereditary/ secondary lactase deficiency
- Vegetarian
- Infants with documented IgE-mediated allergy to cow's milk protein

Soy-based infant formulas has no proven benefit in :

- Acute gastroenteritis with no proven lactose intolerance
- Infants with colic
- Prevention of allergy in healthy or high-risk infants
- Infants with documented cow's milk protein induced enteropathy or enterocolitis
- premature infants < 1800g (increases risk of osteoporosis and rickets)
- CF patients

Hypoallergenic Infant Formula

They may contain partially hydrolyzed protein, extensively hydrolyzed protein, or free amino acids

Extensively hydrolyzed and free amino acid-based infant formulas have been demonstrated to be tolerated by at least 90 percent of infants with documented allergies

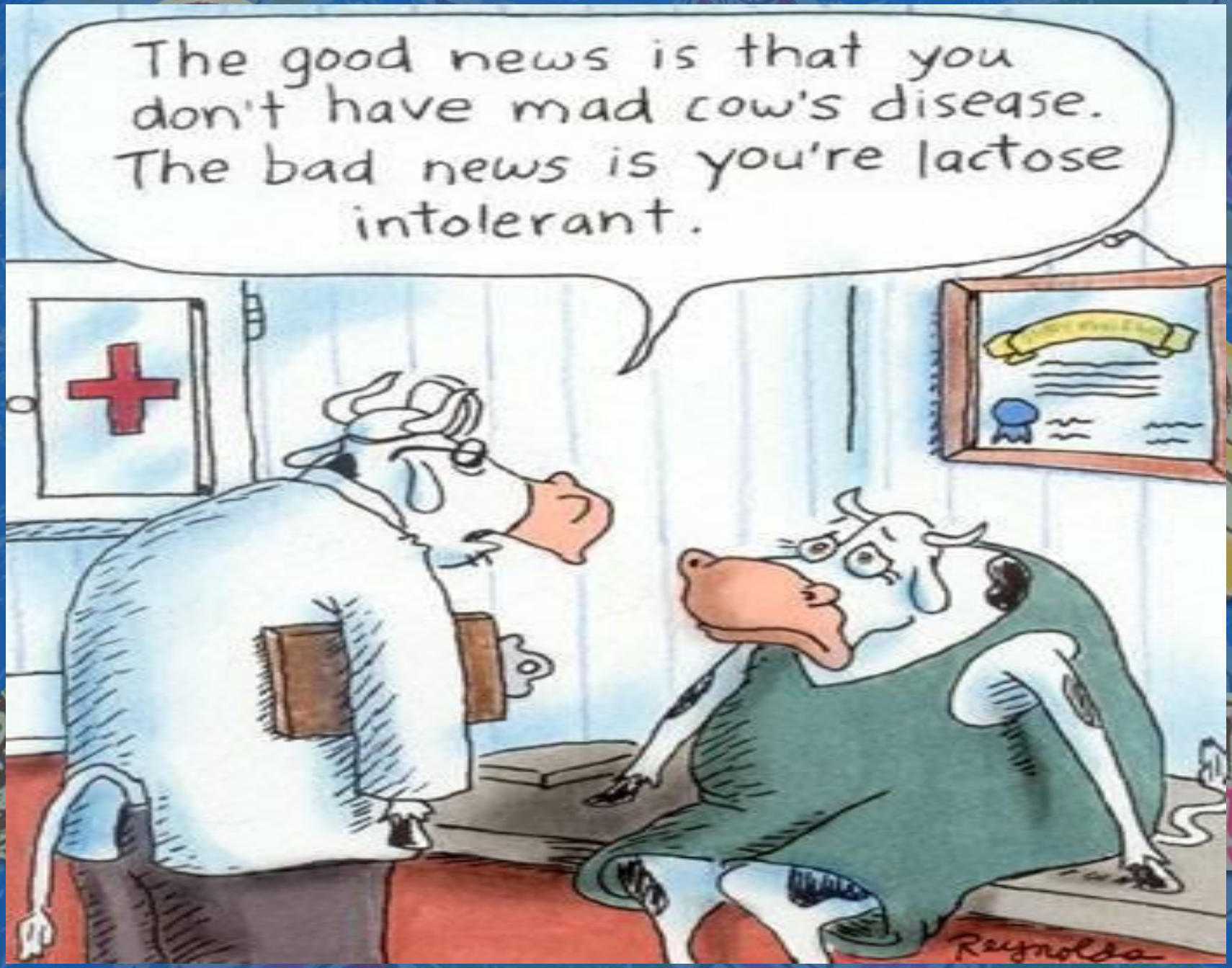
Currently available partially hydrolyzed infant formulas are not hypoallergenic and should not be used to treat infants with documented allergies

Extensively Hydrolyzed Protein Infant Formula :

- Protein: casein hydrolysate and amino acids
- Carbohydrate: modified starch, corn syrup, sucrose
- Fat: blend of vegetable oils, DHA and ARA, some contain medium chain triglyceride (MCT) oil
- Indications: allergy to intact cow's milk or soy protein; GI malabsorption
- Examples: Pregestimil Lipil, Similac Alimentum Advance, Nutramigen Lipil ,Alfare`

Elemental Infant Formula:

- Protein: free amino acids
- Carbohydrate: corn syrup solids
- Fat: blend of vegetable oils, DHA and ARA, some contain medium chain triglyceride (MCT) oil
- Indications: severe protein allergy, severe GI impairment
- Examples: Neocate Infant, Elecare


The good news is that you don't have mad cow's disease. The bad news is you're lactose intolerant.
Reynolds

Premature Infant Formulas:

Indication: preemies < 1.8 Kg, <36 wk gestation

Differences from standard formula:

*↑ Protein (whey predominant)

*↑ MCT oils (40-50%)

*↓ Lactose

* Iron and vitamin E concentrations altered to prevent hemolytic anemia

Examples:

Enfacare, Enfamil Premature, Similac Neosure

Whole cow's milk ***not*** be fed to infants during the first year of life

1. Inappropriate Nutrient Content

- Low intakes of iron, linoleic acid (an essential fatty acid), and vitamin E
- Excessive intakes of sodium, potassium, chloride, and protein
- Most dramatic effect on iron status

(little iron–milk composition inhibit the absorption)

2. Microscopic gastrointestinal bleeding and blood loss

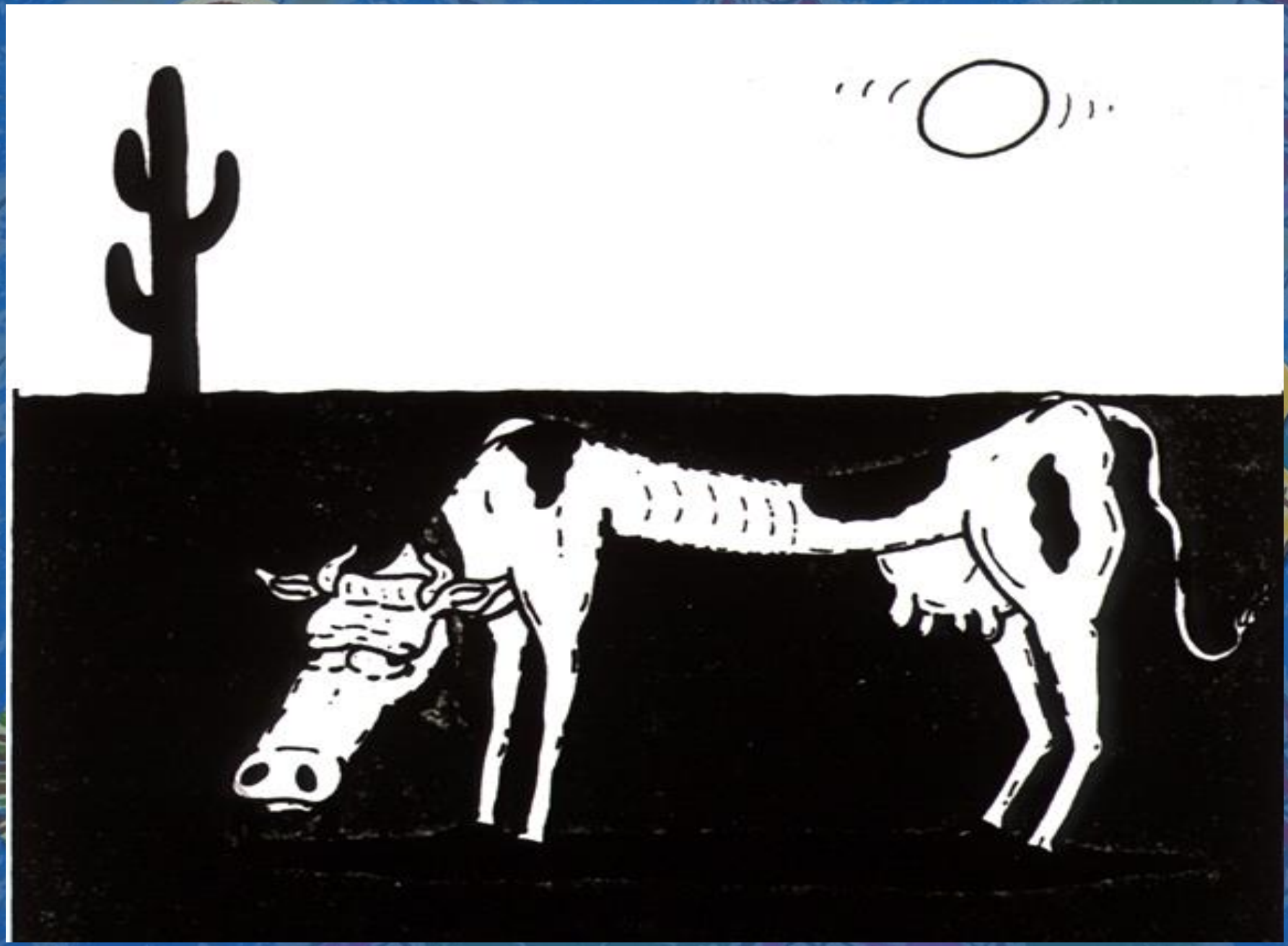
- Cause microscopic bleeding and blood loss from an infant's immature gastrointestinal tract
- This bleeding promotes the development of iron deficiency anemia
- IDA in early childhood may lead to long-term changes in learning and behavior that might not be reversed even with iron supplement.

3. Stress on the kidneys

- High renal solute load which is two to three times higher than that of formula-fed infants
- Greater risk for developing dehydration which is greatest during: an acute illness when intake is lower, especially if there is fever; when the diet is calorie dense

4. Hypersensitivity (allergic) reactions

- Cow's milk contains proteins that may cause hypersensitivity (allergic) reactions in the young infant due to his immature gastrointestinal tract



Low-Fat or Skim Cow's Milk

- Low-fat milk (1 or 2 percent low-fat milk) should not be fed to infants
- These milks contain insufficient quantities of fat (including linoleic acid), iron, vitamin E, and vitamin C; and excessive protein, sodium, potassium, and chloride
- The amount of protein and minerals in low-fat and skim milk is even higher than in whole cow's milk; these milks place a strain on an infant's kidneys in the same way as does whole cow's milk

Consumption of skim or low-fat milk is not recommended in the first 2 years of life because of the high protein and electrolyte content and low caloric density of these milks

Goat's Milk

- **Not** recommended for infants
- Contains inadequate quantities of iron, folate, vitamins C and D, thiamin, niacin, vitamin B6, and pantothenic acid
- This milk also has a higher renal solute load compared to cow's milk and can place stress on an infant's kidneys
- This milk has been found to cause a dangerous metabolic acidosis when fed to infants in the first month of life