1. Define probiotics and prebiotics. Give one example of each and their role in gut health.

a. Probiotics:

- Live microorganisms that provide health benefits when consumed in adequate amounts.
- Help maintain the balance of good bacteria in the gut.
- Improve digestion and boost the immune system.
- **Example**: *Lactobacillus acidophilus* (found in yogurt).

b. Prebiotics:

- Non-digestible food components (mainly dietary fiber).
- Serve as food for beneficial gut bacteria.
- Promote the growth and activity of probiotics.
- **Example**: *Inulin* (found in garlic, onions, bananas).

c. Role in Gut Health:

- Probiotics restore healthy gut bacteria, especially after illness or antibiotic use.
- Prebiotics support the growth of good bacteria and improve digestion.
- Together, they enhance gut health, nutrient absorption, and immunity.

2. What are functional foods? How do they differ from fortified foods? Give examples

a. Functional Foods:

- Foods that provide health benefits beyond basic nutrition.
- They naturally contain bioactive compounds that can help prevent diseases or promote health.
- **Example**: Oats (contain beta-glucan which helps lower cholesterol).

b. Fortified Foods:

- Foods that have nutrients added to them that are not originally present or are present in small amounts.
- Fortification is done to prevent or correct nutritional deficiencies.
- **Example**: Milk fortified with vitamin D

c. Difference Between Functional and Fortified Foods:

Feature	**Functional Foods**	**Fortified Foods**
Nutrient Source	Naturally occurring bioactive compounds	Added nutrients
Purpose	Promote health, prevent disease	Address nutrient deficiencies
Example	Oats, fatty fish, green tea	Iodized salt, iron-fortified cereals

3.Write short notes on food allergies and food intolerances. Give one example of each.

a. Food Allergies:

- An abnormal immune system reaction to certain proteins in food.
- Even a small amount of the allergen can trigger symptoms like hives, swelling, breathing difficulty, or anaphylaxis.
- **Example**: Peanut allergy – can cause severe allergic reactions in sensitive individuals.

b. Food Intolerances:

- A non-immune response where the body has difficulty digesting certain foods.
- Symptoms are usually less severe and may include bloating, gas, or stomach pain.
- **Example**: Lactose intolerance – the inability to digest lactose, a sugar found in milk.

c.Key Difference:

- **Allergy** involves the immune system and can be life-threatening.
- **Intolerance** involves the digestive system and is generally not life-threatening.

4.Write short notes on Omega-3 fatty acids and their health benefits.

a.Omega-3 Fatty Acids:

- Omega-3 fatty acids are essential polyunsaturated fats that the body cannot produce on its own.
- They are mainly found in fatty fish, flaxseeds, walnuts, and chia seeds.
- The main types are ALA (alpha-linolenic acid), EPA (eicosapentaenoic acid), and DHA (docosahexaenoic acid).

b.Health Benefits:

- **Heart Health**: Reduce the risk of heart disease by lowering blood pressure and triglyceride levels.
- **Brain Function**: Support brain development and may help reduce the risk of cognitive decline.
- **Anti-inflammatory**: Help reduce inflammation, beneficial in conditions like arthritis.
- **Eye Health**: DHA is important for retina function and overall eye health.

Example: Salmon is a rich source of EPA and DHA.

5. Differentiate between HDL and LDL cholesterol.

Difference between HDL and LDL Cholesterol:

Feature	HDL (High-Density Lipoprotein)	LDL (Low-Density Lipoprotein)
Nickname	"Good" cholesterol	"Bad" cholesterol
Function	Carries cholesterol away from the arteries to the liver for removal	Carries cholesterol from the liver to the arteries
Health Impact	Reduces the risk of heart disease	Increases the risk of heart disease and stroke
Desired Level	Higher levels are better	Lower levels are better
Sources	Found in healthy fats like olive oil, fish, nuts	Found in saturated fats from red meat, fried foods

6. What are the effects of dehydration on physical and cognitive health?

Effects of Dehydration on Physical and Cognitive Health:

a. Physical Effects:

- **Fatigue and Weakness**: Reduced blood volume leads to low energy and tiredness.
- **Muscle Cramps**: Lack of fluids affects muscle function.
- **Low Blood Pressure and Dizziness**: Due to reduced fluid levels in the body.
- **Dry Skin and Mouth**: Common signs of fluid loss.
- **Increased Heart Rate**: The heart works harder to maintain blood circulation.

b. Cognitive Effects:

- **Poor Concentration**: Even mild dehydration can reduce focus and attention.
- **Headaches**: Common due to reduced brain hydration.
- **Mood Changes**: Can lead to irritability and anxiety.
- **Memory Problems**: Short-term memory and thinking speed can be affected.

7. How can one identify food adulteration at home? Mention two common tests.

Identifying Food Adulteration at Home:

Food adulteration can be detected using simple tests with household materials. These tests help identify impurities or harmful substances in food.

a. Water Test for Milk:

- **How**: Put a drop of milk on a clean, slanted surface (like a plate).
- **Result**: Pure milk leaves a white trail as it flows down.
  Adulterated milk (with water) flows without leaving a mark.

b. Iodine Test for Starch in Milk:

- **How**: Add a few drops of iodine solution to a small amount of milk.
- **Result**: If the milk turns **blue**, it indicates the presence of starch (an adulterant).

8. Explain the term nutraceuticals with examples.

Nutraceuticals:

- The term *nutraceuticals* combines **"nutrition"** and **"pharmaceuticals."**
- These are food products or supplements that provide health benefits, including the prevention or treatment of disease.
- They go beyond basic nutrition and may help improve overall health, delay aging, or prevent chronic diseases.

Types and Examples:

1. **Dietary Supplements** – e.g., Vitamin D tablets, Omega-3 capsules.
2. **Functional Foods** – e.g., Probiotic yogurt (improves gut health).
3. **Herbal Products** – e.g., Turmeric (contains curcumin, has anti-inflammatory properties).

9. Describe any two harmful effects of junk food on health.

Harmful Effects of Junk Food on Health:

1. Obesity and Weight Gain:

- Junk food is high in calories, unhealthy fats, and sugars.

- Regular consumption leads to excess calorie intake and fat accumulation, causing obesity.

2. Increased Risk of Heart Disease:

- Junk food contains trans fats and high levels of sodium.
- This can raise bad cholesterol (LDL), increase blood pressure, and damage heart health over time.

##10marks questions

1. Compare and contrast organic and conventional foods in terms of nutritional content, safety, and environmental impact.

Aspect	Organic Foods	Conventional Foods
Nutritional Content	- Often higher in antioxidants, vitamins, and minerals.	- Generally similar nutrient levels but may have fewer antioxidants.
	- Contains more beneficial plant compounds (e.g., polyphenols).	- Nutrient content depends on farming and storage conditions.
Safety	- No synthetic pesticides, fertilizers, or GMOs used.	- Use of synthetic pesticides, fertilizers, and GMOs is common.
	- Lower risk of harmful chemical residues.	- Possible presence of pesticide residues in food.
Environmental Impact	- Supports biodiversity and soil health through natural methods.	- Uses synthetic chemicals that may harm soil and water.
	- Reduces pollution and conserves water and energy.	- Can cause soil degradation, water pollution, and biodiversity loss.

| **Additional Points** | - No antibiotics or hormones in organic animal farming. | - Antibiotics and hormones may be used in conventional farming.|
| | - Typically more expensive due to lower yields and labor costs.| - Higher yields and lower production costs make it more affordable.|

2.Explain the concept of intermittent fasting. What are its benefits and limitations based on scientific studies?

Concept of Intermittent Fasting (IF):

- Intermittent fasting is an eating pattern that cycles between periods of eating and fasting.
- It does **not** specify which foods to eat but focuses on **when** to eat.
- Common methods include:
    - **16/8 method**: Fasting for 16 hours, eating within an 8-hour window.

- **5:2 diet**: Eating normally 5 days a week and restricting calories on 2 non-consecutive days.
- **Alternate-day fasting**: Alternating between fasting and eating days.

Benefits of Intermittent Fasting (Based on Scientific Studies):

- **Weight Loss and Fat Reduction:** Helps reduce calorie intake and improves fat burning.
- **Improved Metabolic Health:** Enhances insulin sensitivity and lowers blood sugar levels.
- **Heart Health:** Reduces risk factors like blood pressure, cholesterol, and inflammation.
- **Cellular Repair:** Increases autophagy, a process that cleans damaged cells, promoting longevity.
- **Brain Health:** May improve brain function and reduce the risk of neurodegenerative diseases.

Limitations and Risks:

- **Hunger and Energy Levels:** May cause irritability, fatigue, or difficulty concentrating, especially at the start.
- **Not Suitable for Everyone:** Pregnant women, people with certain medical conditions, or those with eating disorders should avoid IF without medical advice.
- **Potential Nutrient Deficiency:** If not planned well, IF may lead to inadequate nutrient intake.
- **Long-term Effects:** More long-term research is needed to fully understand the impacts of IF.

3.Discuss the influence of media on food choices and nutrition perception. Provide examples.

Influence of Media on Food Choices and Nutrition Perception:

1. **Advertising and Marketing:**
    - Media platforms (TV, social media, internet) promote specific foods, often fast foods, snacks, and sugary drinks.
    - Attractive ads influence consumers, especially children and young adults, to prefer unhealthy foods.
    - **Example:** TV commercials for fast food chains encouraging frequent consumption.
2. **Social Media Trends:**

- Influencers and celebrities share food trends, diets, and supplements, shaping public opinion.
- Sometimes promote healthy eating (e.g., veganism, keto diet), but can also spread misinformation or fad diets.
- **Example:** Viral diet challenges on Instagram or TikTok impacting eating habits.

3. **Shaping Nutrition Perceptions:**
   - Media shapes what is considered "healthy" or "trendy," which may not always align with scientific evidence.
   - Can create confusion due to conflicting messages about foods or nutrients.
   - **Example:** Media hype around superfoods like kale or quinoa, sometimes exaggerating benefits.
4. **Influence on Cultural Food Choices:**
   - Media introduces people to global cuisines and food products, broadening food preferences.
   - However, it may also encourage consumption of processed and convenience foods.
5. **Educational Role:**
   - Media can also be a tool for nutrition education and raising awareness about healthy eating.
   - Government campaigns use media to promote balanced diets and physical activity.

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4. Explain the impact of heating and pressure on food nutrients with suitable illustrations or examples.
   Impact of Heating and Pressure on Food Nutrients:

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1. Effect of Heating:

- **Vitamin Loss:**
  - Heat-sensitive vitamins like **Vitamin C** and some **B vitamins** (e.g., thiamine, folate) are easily destroyed during cooking.

    - Example: Boiling vegetables like spinach causes significant loss of Vitamin C due to heat and water leaching.
- **Protein Denaturation:**
    - Heat causes proteins to unfold and coagulate, which can improve digestibility but may reduce the availability of some amino acids.
    - Example: Cooking eggs solidifies the proteins, making them easier to digest.
- **Mineral Stability:**
    - Minerals (e.g., calcium, iron) are generally stable to heat but may leach into cooking water, reducing their content in food if water is discarded.
    - Example: Boiling potatoes may cause minerals to leach into the water.
- **Improved Nutrient Availability:**
    - Some nutrients become more bioavailable after heating.
    - Example: Cooking tomatoes increases the availability of lycopene, an antioxidant.

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2. Effect of Pressure (Pressure Cooking):

- **Reduced Nutrient Loss:**
    - Pressure cooking uses less water and shorter cooking times, which helps retain more water-soluble vitamins compared to boiling.
    - Example: Pressure-cooked vegetables retain more Vitamin C than boiled ones.
- **Improved Food Safety and Digestibility:**
    - High pressure kills bacteria and softens tough fibers, improving nutrient absorption.
    - Example: Pressure cooking legumes reduces cooking time and improves protein digestibility.
- **Potential Vitamin Degradation:**
    - Excessive pressure and heat may still degrade some sensitive vitamins, but overall loss is less than conventional cooking.