Q4

Boiled eggs & Boiled rice with daal have distinct nutritional profiles with each offering something better than other. For now, we will consider [100gm] of both i.e. 100gm of boiled rice with daal & 100gm of boiled egg (or 2 large boiled egg). Below table represents the nutritional profile of both of amount 100gm:

	Average quantity per 100gm of Eggs	Average quantity per 100gm of boiled rice
Calories	142 Cal	146.5 Kal
Carbohydrates	1.4 grams	36 grams
Proteins	12.2 grams	12 grams
Fats	9.9 grams	6 grams
Vitamins	D, zinc, calcium & all the B	B-complex especially B12 riboflavin
Sugars	0.3 gram	0.1 gram
Serving Size/ Daily Size(%)	A serve of egg will provide 500KJ-600KJ	500 KJ-600 KJ

The combination of boiled rice & daal delivers a more balanced macronutrient profile, with increased carbs, moderate protein & minimal fats, compared to high protein & fat content in eggs.

Adding daal to boiled rice significantly increases the overall nutritional value by increasing the protein content. This combination also increase fiber intake, supporting digestive health. However, it also increases the carb content, making it more energy dense than boiled egg.

While boiled eggs are a concentrated source of high-quality protein & healthy fats, they lack the fiber & complex carbs found in daal & rice. Eggs are more suitable for those prioritizing protein & healthy fats over carbs. Both foods shows some similarity & complements each other with rice & daal being ideal for providing balanced energy & eggs for protein intake.

Q5

1. Kamal Kakri

(a) Common/Vernacular/Local Name: Komal Kakri

(b) English Name: Lotus Root

(c) Seasonal Use: Available during winter season & is majorily found in China. In India it is present in Kerela

(d) Nutritional Values (per 100gm)

Calories: 74 Cal ; Carbs: 17g ; Protein: 2.6g

Fiber: 4.9 g

⇒ Contains Vitamin C, potassium & dietary fibers.

2. Kokum

a) Common Name: Kokum

b) English Name: Mangosteen (Indian)

c) Seasonal Type/Use: Typically available during the summer used in curies, beverages & Medicinal purposes

d) Nutritional value (100gm)

Calories: 60 Cal ; Carbs: 15g

Vitamin C & rich in antioxidants, Known for aiding digestion

3. Sahejne Ki Fali

a) Common Name: Sahejne Ki Fali

b) English Name: Drum Sticks

c) Seasonal Use: Avalaible year around, but most commonly used in Monsoon & winter seasons. Used in curries, soups & traditional Medicines.

d) Nutritional Value (100gm)

Calories 64 cal ; Carbs 8.5g ; Protein 9.4g

Fiber 2g

Rich in Vitamin C, A, calcium & iron. Known for boosting immunity & digestion.

4. Ratalu (Kand)

a) Common Name: Ratalu

b) English Name: Purple Yam

c) Seasonal Use: Mostly harvested in winter, used in various traditional dishes & sweets.

d) Nutritional Value (100gm)

Calories: 118 cal ; Carbs: 27g ; Protein: 1.5g

Fiber: 4g

Rich in Vitamin C, Potassium & dietary fiber. Known for its antioxidant properties & benefits in controlling blood sugar levels.

5. Kaddu ke Patte

a) Common Name: Kaddu ke Patte

b) English Name: Pumpkin leaves

c) Seasonal Use: Mostly used in during the monsoon season when pumpkin vines flourish. Often used in traditional used in traditional dishes, soups & stir fries.

d) Nutritional Values (100gm)
Calories: 27Cal ; Carbs: 4g ; Protein: 3g
Fiber: 1g
Rich in Vitamin A, C, calcium, Iron. Known for promoting eye health.

6/ Roselle Leaves
a) Common Name: Ambadi Patta in Marathi & Gongura in Telugu
b) English Name: Roselle Leaves
c) Seasonal Use: Typically available during ~~non~~ monsoon & early winter. commonly used in pickles, chutney.
d) Nutritional Values: (100gm)
Calories: ~~49g~~ 49gm ; Carbs: 11g Proteins 1.5g
Fiber 3g
Rich in Vitamin C, iron, calcium & antioxidants.
Known for its ability to reduce hypertension.

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Q7

The standard Method for measuring the calorific content of food is BOMB CALORIMETRY. In this technique, a small sample of food is placed in a sealed, pressurised container called bomb calorimeter. The sample is then flamed which causes it to burn completely. The heat released during combustion is measured by the temperature rise in the water surrounding the container, the energy content is then calculated. This method provides a direct measurement of energy released during complete combustion, which corresponds to food's calorific value.

Q6

a) To give a scienceful insight, it is true that cooking food by any method does tend to cause some of nutrients to breakdown. However, there are plenty of nutrients left. And cooking kills many microbes that might have contaminated the food & might have cause problems. But Microwave cooking is actually one of the least likely forms of cooking to damage nutrients. That's because, the longer the food cooks, the more nutrients tend to breakdown. & microwave cooking takes less time. So cooking in an oven is more likely to cause some loss of nutrients than in microwave. And boiling vegetables is more likely to rob them of nutrients than either cooking then in microwave or oven, as some nutrients leach out of food into the water.

Reference - health.hazard.edu/staying-healthy

b) Refrigeration is one of the best way to prevent food born illness. So refrigeration doesn't destroys nutrient. In simple words, it slows down at time at low temperature, & longer the food stays in refrigerator, the slower it get spoiled. Most nutrients in cooked foods are relatively stable during refrigeration. Vitamins like Vitamin C may see some degradation ova time, but majority of nutrients are well preserved.

c) "Eating GMO plants is no more risky than their non-GMO Equivalent".

First of all for plants, GMO is used to produce a more nutrient rich crop. This modification strictly increases the production cost & it attracts for more insects which leads to more investments on pesticides. This all leads to a tight budget which farmers usually don't have, so they don't prefer it. Note, GMO plants consumption is not risky because before reaching to market, it get verified on the basis of its nutrients by various industries. But GMO plants are generally modified in such a way that they are harmful to insects but consumable to humans.

For animals, GMO holds great potential in many fields including agriculture, medicine, but the transfer of genetic material from one species to another raises potentially serious health issue for them. In many case, selective breeding is just as effective as GMO

& doesn't carry the same risk.

So conclusively, there is a great potential of GMO in plants with low risk but there is great potential of GMO in animal with high risk

Q8a) Culinary Diet platform: A platform designated for personalized diets based on an individual's genetics, that predicts responses to certain foods & beneficial for long term health.

b) Texture Tech 3D printer: A specialized 3D food printer that can to create complex textures by manipulating food polymer based on computational Model. It is beneficial because it emits culinary innovation by improved accessibility.

c) Robotic Chefs: Advanced robotics could automate routine kitchen tasks, such as chopping, cooking which is a revolution in gastronomic field.

d) MicroBalancer: An AI system that analyses & adjusts fermentation processes in real-time for optimal microbial balance in foods.

e) Nutrients-optimized plant-Based Meat: The formulation of plant-Based Meat with improved nutritional profile, specifically targetting deficits in essential nutrients.

f) Erythritol-Stevia Blends: Combinations that balance erythritol's cooling effect with stevia's intense sweetness, closely approximating sugar's taste & mouthfeel.

g) Virtual Reality Culinary Experience: Immersive VR experience could allow users to taste & experience different cuisines from around the world

h) Waste Analytics: The system tracks food waste over time, providing insights to help users improve their habits.

i) Sustainable Sourcing Recommendations: Algorithms can promote the use of locally sourced, seasonal ingredients, reducing the carbon footprint associated with transportation & the waste of out of season produce that may not sell quickly.

j) A dedicated AI for cgas: A dedicated AI which works & trained on extreme & huge data of cgas like from flavordb which is much more accurate than the other AI.

k) Flavor & Smell Detector: Yet a hard task but this branch has potential to work on flavor or smell detection through working on the molecular structure of ingredients.