



Food and Agriculture Organization
of the United Nations

FUTURE ON A PLATE

Chef's foresight menu

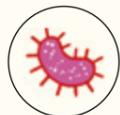
FOOD SAFETY CONSIDERATIONS

This foresight menu invites you to imagine the future of food. It showcases dishes inspired by innovations still in the lab, early development or pilot production – foods not yet found on the market. These innovations could reshape how we eat by diversifying diets, boosting nutrition, supporting health and reducing environmental impacts through alternative proteins, new ingredients, and cutting-edge food technologies. But for these meals to become part of our menus, key food safety considerations must be addressed, including:



ALLERGEN RISKS

Many of the novel ingredients listed in the menu, such as insect flours, precision-fermented proteins, and alternative plant or fungal products, could trigger allergic reactions. For example, crickets may cause reactions similar to shellfish allergies, and precision-fermented dairy proteins, although produced without animals, could potentially contain milk allergens. Careful allergen assessment, labelling, and management strategies will be essential for these foods to become part of everyday diets.



MICROBIOLOGICAL HAZARDS

While innovations such as cell-based foods, precision-fermented ingredients, and hydroponically grown microgreens are produced in controlled environments, they are not inherently free from microbiological risks. Like all foods, they can still be contaminated if strict hygiene, temperature and sanitation controls are not carefully maintained from production to plate.



CHEMICAL OR TOXIN HAZARDS

Ingredients such as edible insects, algae, underutilized grains, and nano-encapsulated nutrients may carry chemical risks, including heavy metals, pesticide residues, or naturally occurring toxins, depending on how they are cultivated and processed. Emerging nano-encapsulation and packaging technologies require thorough assessment to ensure they do not lead to unintended chemical migration into foods or pose unforeseen health risks.

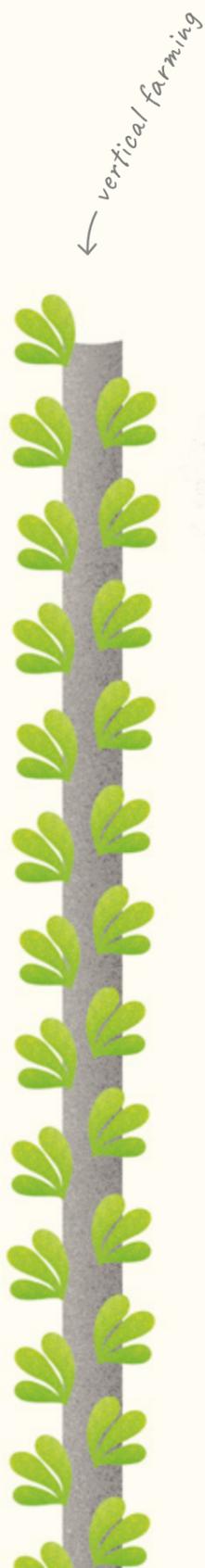


FOOD SAFETY ASSESSMENTS

As most of these foods and production methods are still in the research, development or pilot stages, they will need to pass rigorous safety checks before reaching your plate. This includes evaluating potential health risks, establishing clear labelling requirements, and ensuring that production processes are safe, consistent, and meet food safety standards.

Note: The symbols above are used throughout this menu to identify potential food safety hazards associated with each course.

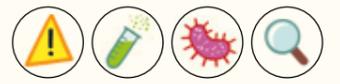
Starters



CRICKET AND POTATO CROQUETTES

Golden-fried croquettes made with cricket flour and spiced potato, served with tangy avocado-lime cream.

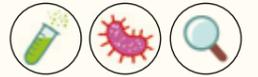
*Finely milled crickets can be used to increase protein content and a subtle nutty note to the dish.



OCEAN EMERALD CONSOMMÉ

Crystal clear kelp and spirulina broth garnished with microalgae caviar pearls and hydroponic herbs.

*Edible algae add an emerald hue and subtle marine flavour while potentially providing beneficial nutrients.



SKY FARM SALAD

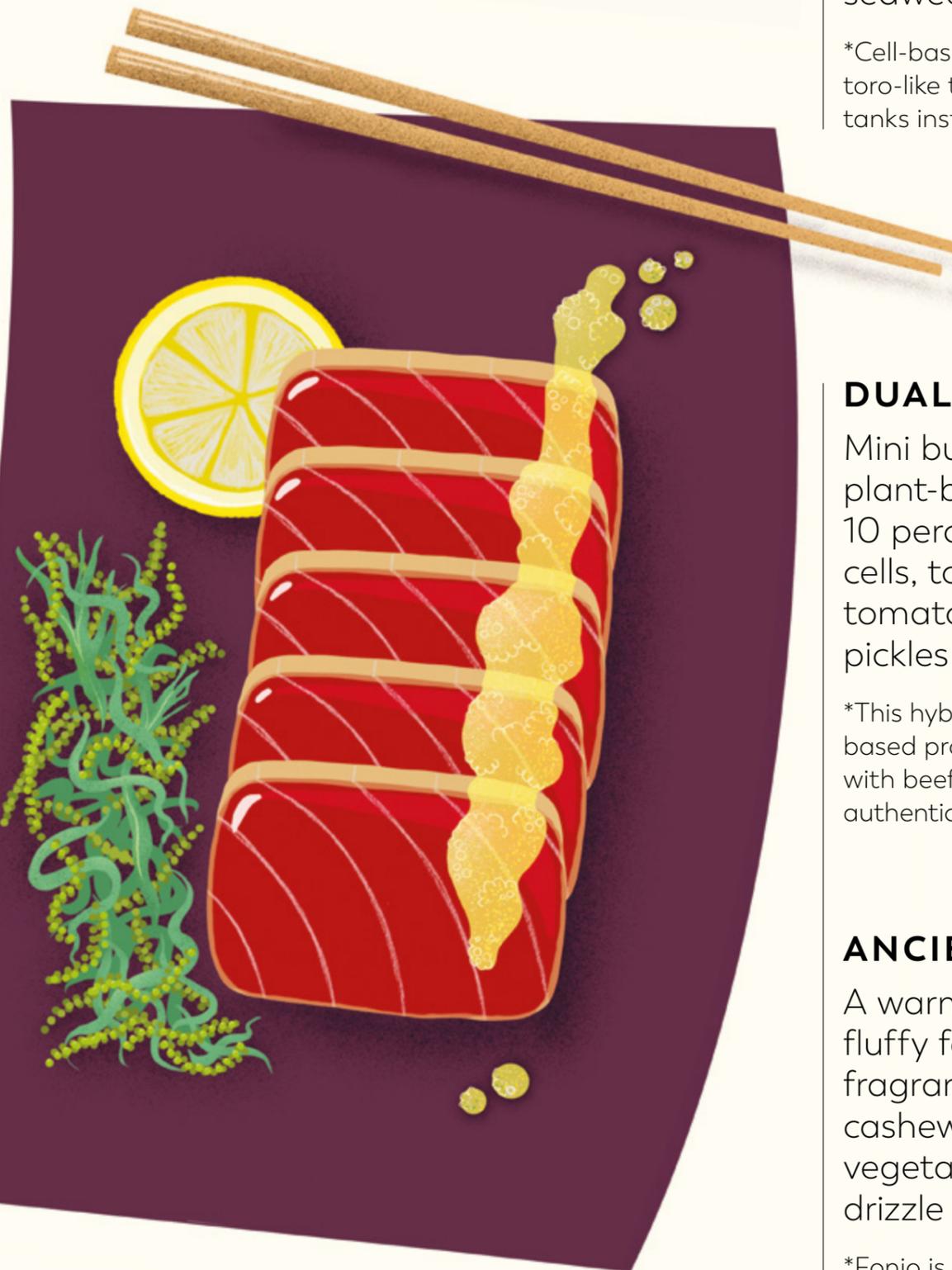
A lush medley of vertically farmed baby greens tossed with heirloom tomatoes and edible flowers in a light citrus vinaigrette.

*Grown in a high-rise hydroponic farm, these greens flourish under LED lights and precise climate control, with no need for pesticides.



Mains

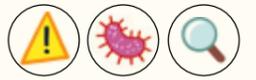
tuna cells →



UMAMI MYCELIUM STEAK

Succulent mushroom mycelium filet mignon, marinated in herbs and peppercorn, pan-seared and served with truffle-infused jus and root vegetable purée.

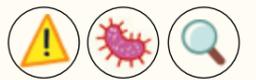
*Fungal mycelium forms tender, protein-rich cuts that mimic beef, grown indoors on nutrient-rich substrates under precise monitoring.



OCEAN-FREE BLUEFIN

Sashimi-grade cell-based tuna, lightly seared tataki-style and drizzled with ponzu foam, paired with a sea grape seaweed salad.

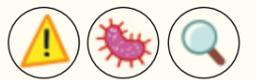
*Cell-based seafood replicates rich, fatty toro-like tuna from starter cells grown in tanks instead of the ocean.



DUALITY SLIDER

Mini burgers with 90 percent plant-based protein and 10 percent cultivated beef cells, topped with heirloom tomato jam and fermented pickles on a brioche bun.

*This hybrid approach combines plant-based proteins, which provide structure with beef cells grown in a bioreactor for an authentic aroma and juiciness.



ANCIENT GRAIN 5K

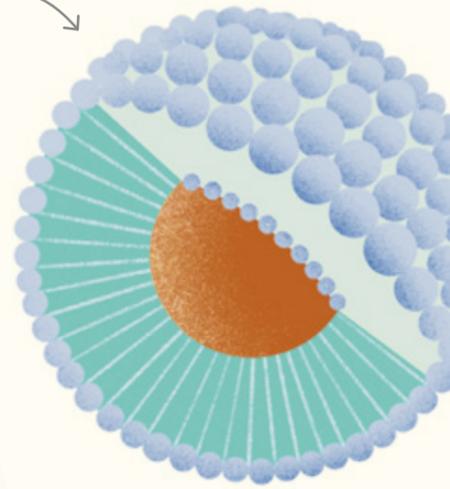
A warm grain bowl featuring fluffy fonio simmered with fragrant spices, toasted cashews and roasted seasonal vegetables, finished with a drizzle of tamarind glaze.

*Fonio is a 5,000-year-old underutilized grain with a light, couscous-like texture and nutty flavour.





nano-encapsulation →



BAOBAB NANO-CRISPS AND SHIITAKE

Crisp slices dusted with antioxidant-rich baobab and fermented shiitake powder, packed in nano-encapsulated spice for gradual flavour release.

*Nano-encapsulation stabilizes bioactive ingredients during storage and releases them upon consumption.



RE-GEN FLATBREAD AND TARWI BEAN HUMMUS

Stone-baked flatbread made from nutrient-rich brewery spent grains, served with creamy tarwi bean hummus.

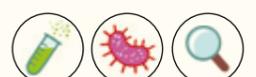
*Using spent grains reduces food waste and adds fibre and nutrients to the flatbread.



DESERTSALINE CHICKPEA MATRIX

Freshly baked flatbread made with chickpeas cultivated using saline irrigation, brushed with an edible coating encapsulating rosemary extract for antimicrobial protection.

*This innovative coating preserves freshness and safety while imparting a subtle herbal aroma to each bite.



Sides

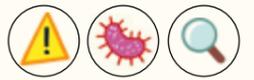
Desserts



BEANLESS BLISS

Dense, fudgy brownie made with cocoa analogue from fermented carob and barley malt extracts, delivering authentic chocolate flavour without cocoa.

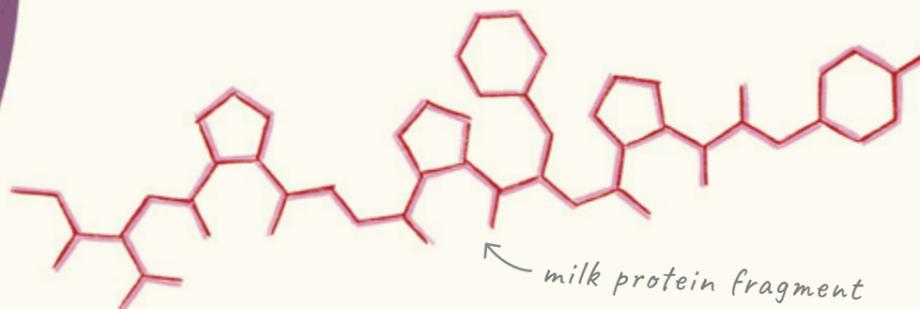
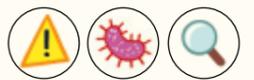
*As cacao supplies face growing pressures, precision-fermented carob and roasted barley malt can potentially replicate cocoa's aroma and bitterness for a rich, chocolatey experience.



NO-COW CHEESECAKE

Rich and creamy cheesecake made with animal-free dairy proteins produced by precision fermentation, set on a toasted almond crust and topped with berry compote.

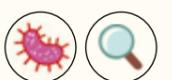
*Precision fermentation uses microbes to produce milk proteins almost identical to those found in cow's milk.



AI-CRAFTED PORCINI CRÈME BRÛLÉE

Classic vanilla bean custard subtly infused with porcini mushroom essence and topped with candied bacon pieces, finished with a crackling caramelized sugar crust.

*This unconventional pairing was conceived with AI assistance, using flavour algorithms to identify unexpected yet harmonious combinations that deliver a uniquely savory-sweet dessert experience.





edible straw →

SYMBIOTIC SPRITZER

Sparkling kombucha green tea, blended with ginger and tropical juices, lightly sweetened with prebiotic agave fibre and served with edible algae-based straw.

*This refreshing elixir combines probiotic kombucha with prebiotic fibres for a synbiotic boost, served with an edible, compostable seaweed straw.



VITAMIN HALO SMOOTHIE

Golden blend of mango, carrot, and pineapple, enriched with nano-encapsulated omega-3 and B vitamins, and microencapsulated probiotic cultures, creating a thick, creamy smoothie.

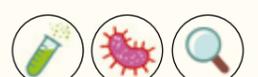
*Nano-encapsulation masks nutrient and microbial flavours, ensuring gradual release of bioactive compounds and probiotics during digestion.



PHOTOACTIVATED CHLOROPHYLL LATTE

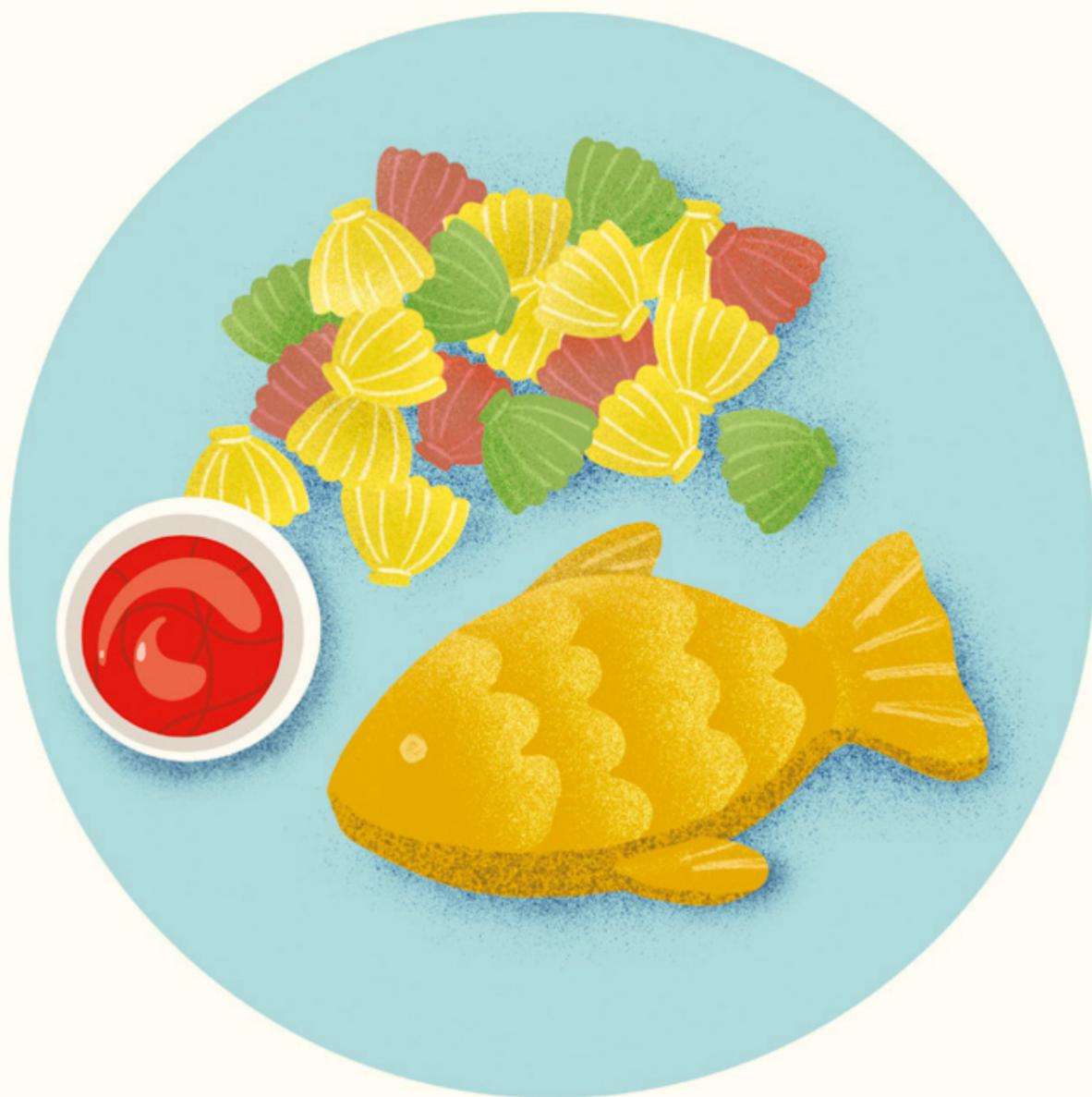
Creamy plant-based latte infused with chlorophyll-rich microalgae extract, activated with food-grade light exposure before serving to enhance antioxidant potency.

*Photoactivation uses targeted light wavelengths to boost the bioactivity of chlorophyll compounds in the drink, offering a refreshing beverage with enhanced functional benefits.



Drinks

Children's menu



CELLUCHICKEN BITES

Tender bite-sized nuggets made from cell-based chicken, lightly breaded and oven-baked for a familiar favorite.

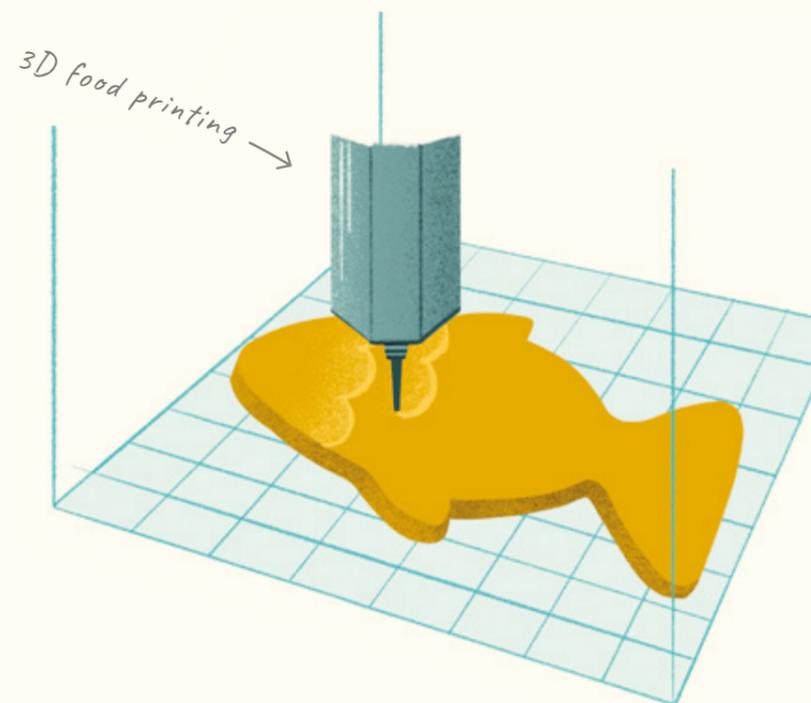
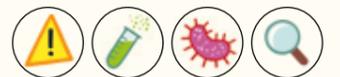
*Cell-based production grows chicken meat directly from animal cells, offering an authentic taste and texture.



SHELL-VIT 3D FILLET

A playful course featuring shell-shaped bambara groundnut-based pasta enriched with essential vitamins, served alongside a fish-shaped 3D printed fillet fortified with omega-3.

*Advanced 3D food printing creates fun, nutrient-tailored foods in engaging, child-friendly shapes.



AI-CE DREAM

Creamy frozen dessert bite sweetened with sugar-free sweetener discovered by AI, creating a delicious ice cream treat without using any sugar.

*Artificial intelligence is used to identify and develop new sweet compounds, delivering a smooth, sweet ice cream experience without affecting blood sugar levels.





Takeaway

Meals in this menu are available with innovative packaging solutions featuring:

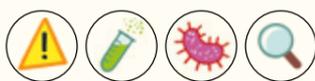
ACTIVE PACKAGING CONTAINERS

Packaging integrated with antimicrobial or oxygen-absorbing films to maintain freshness and extend shelf life.



EDIBLE COATINGS AND FILMS

Transparent, flavourless edible layers applied directly to fruits, baked goods, meat, fish and snacks to seal in moisture while delivering natural preservatives.



BIODEGRADABLE BIOPLASTICS

Compostable containers crafted from bioplastics, seaweed-based materials, or chitin-based materials, designed for safe food contact and rapid environmental breakdown after use.



NANO-ENCAPSULATED FRESHNESS SYSTEMS PACKAGING

Packaging materials embedded with nano-capsules that gradually release antimicrobial or antioxidant agents to preserve quality and flavour integrity over time.



BALANCING INNOVATION WITH FOOD SAFETY

While the dishes featured on this menu showcase the exciting promise of emerging food innovations, it is important to note that they may also introduce unexpected food safety risks if not carefully managed. For example, the **SKY FARM SALAD** uses greens cultivated under LED lighting in vertical farms, which can carry unforeseen contamination risks if materials in lighting systems are not properly assessed. One study traced mercury contamination in vegetables and herbs back to a catalyst used in the production of plastics mounting LED lights (Ng *et al.*, 2023).

The **BAOBAB NANO-CRISPS AND SHIITAKE** and **VITAMIN HALO SMOOTHIE** utilize nano-encapsulated nutrients to enhance flavour release, protect sensitive bioactive compounds during storage, and improve bioavailability. While nano-encapsulation offers functional benefits, such as masking undesirable tastes and enabling targeted release in the digestive tract, concerns exist about potential migration of nanoparticles into foods, their behaviour during digestion, and risks of bioaccumulation or toxicity if particles are not fully degraded or metabolized (Kamble *et al.*, 2025; Taouzin *et al.*, 2023).

The **NO-COW CHEESECAKE** is made with precision-fermented dairy proteins produced by engineered microbes to replicate milk proteins without animal use, offering potential ethical and nutritional advantages. However, despite being structurally similar to animal-derived proteins and having low initial allergenicity concerns, each product must still be thoroughly tested. This includes checking for unexpected allergenic or toxicological risks to ensure food safety (Grundy *et al.*, 2024; Niyigaba *et al.*, 2025).

Innovative packaging solutions such as **NANO-ENCAPSULATED FRESHNESS SYSTEMS** and **ACTIVE PACKAGING CONTAINERS** help extend shelf life by incorporating antimicrobial agents, oxygen scavengers, or nano-encapsulated antioxidants (Kamble *et al.*, 2024). While these technologies can inhibit microbial growth, delay oxidation and reduce food waste, they must be rigorously assessed to ensure active compounds or nanomaterials do not migrate into foods at harmful levels. Factors such as chemical stability, release behaviour under different conditions, and cumulative dietary exposure if used widely must be evaluated.

Edible antimicrobial coatings, such as those used on the **DESERTSALINE CHICKPEA MATRIX**, offer innovative ways to reduce spoilage without synthetic preservatives. Although generally regarded as safe, these coatings need to be assessed for potential allergenicity, interactions with food components, effects on gut microbiota, and the safety of any novel nano- or microencapsulated additives used (Matloob *et al.*, 2023).

As food systems evolve to embrace novel approaches and innovations, robust food safety assessments, full lifecycle evaluations, and proactive risk management will be essential to protect consumer health while advancing sustainable, nutritious and innovative dining experiences.

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