14th International Contest for Note by Note Cuisine 2026

Note by Note RAMEN

Reduce production costs and time, reduce calories, but mind the flavour

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Materials and Methods

All components are presented below in assembly order, from broth through to garnishes. Sosa Ingredients products are identified by their catalogue names. Quantities are given per single portion (1 bowl) unless otherwise stated. The noodle section (4.2) presents all three trialled methods before identifying the selected approach.

1.1 Ghost Stock (Broth)

The broth is the soul of ramen. Traditional tonkotsu broth is produced by simmering pork bones at a rolling boil for 10–18 hours, extracting collagen (converted to gelatin), fat, and flavour compounds — principally free glutamic acid, inosinic acid (IMP), and a suite of Maillard and thermally-generated aroma molecules. The NbN equivalent assembles these molecules directly, bypassing the extraction entirely.

1.1.1 Equipment

500 ml beaker, magnetic stirrer and hotplate, precision analytical balance (0.001 g), thermometer, 300 ml serving bowl.

1.1.2 Ingredients (per 300 ml serving)

Ingredient	Quantity	Brand / Supplier	Description / E-number
Water	300 ml	—	Filtered water, 80°C
Monosodium glutamate (MSG)	0.60 g	Louis François	L-glutamic acid sodium salt, E621
Disodium inosinate (IMP)	0.20 g	Louis François / Breko	Ribonucleotide, E631
Disodium guanylate (GMP)	0.05 g	Louis François / Breko	Ribonucleotide, E627
Sodium chloride	0.40 g	—	NaCl, seasoning
Xanthan Gum	0.05 g	Sosa	E415, thickener / mouthfeel

Ingredient	Quantity	Brand / Supplier	Description / E-number
		Ingredients	
2-methyl-3-furanthiol solution*	0.002 ml	Symrise / Breko	Roasted meat note, active <0.01 ppb
Dimethyl trisulfide solution*	0.003 ml	Symrise / Breko	Brothy depth, <0.1 ppb
Methional solution*	0.003 ml	Symrise / Breko	Maillard/potato note, E-number not applicable
Riboflavin	0.002 g	Louis François	E101, natural golden colour

* Volatile aroma compounds prepared as 0.01% v/v solutions in food-grade ethanol (96%), added off-heat to preserve aroma integrity.

1.1.3 Method

1. Heat 300 ml filtered water to 80°C in a beaker on a hotplate with magnetic stirring.
2. Add MSG, IMP, GMP, NaCl, and riboflavin. Stir until fully dissolved (approximately 60 seconds).
3. Sprinkle Xanthan Gum slowly while stirring continuously to prevent clumping. Stir for 2 minutes until incorporated and broth has a light, glossy viscosity.
4. Remove from heat. Add volatile aroma solutions using a calibrated micropipette. Stir gently for 10 seconds — do not reheat after aroma addition.
5. Transfer immediately to serving bowl, pre-warmed to 60°C. Serve at 80°C.

2.2 NbN Noodles — Three Methods Trialled

Ramen noodles present the most technically interesting challenge in this dish: they must be formed into recognisable strands, carry a wheat-analogous aroma and colour, possess an elastic, slippery texture in hot broth, and — in the contest context — be produced live at the table in under three minutes to demonstrate the drama of NbN cooking. Three distinct protein and hydrocolloid strategies were trialled.

2.2.1 Trial 1: Metilgel Thermoreversible Noodles (Selected Method)

Methylcellulose exhibits thermally reversed gelation: it is a viscous liquid when cold and forms a firm gel when heated above its gelation temperature (50–55°C). This property, exploited by Wylie Dufresne and others in modernist cookery, allows noodles to be extruded live into hot broth, solidifying in under three seconds and creating a live performance with immediate edible results.

Equipment

Precision balance, 500 ml beaker, immersion blender, squeeze bottle (nozzle diameter 4 mm), thermometer, serving bowl containing hot broth at 85°C.

Ingredients (per 100 ml noodle base, yields approximately 80 g noodles)

Ingredient	Quantity	Brand / Supplier	Description / E-number
Metilgel (Methylcellulose)	2.0 g	Sosa Ingredients	E461, thermal gel, plant cellulose
Water (cold, <10°C)	100 ml	—	Filtered, cold hydration required
Riboflavin	0.05 g	Sosa Ingredients / Louis François	E101, wheat-yellow colour
2-acetyl-1-pyrroline solution*	0.001 ml	Symrise	Toasted wheat / popcorn aroma, active at ppb
Sodium chloride	0.10 g	—	NaCl, seasoning

* 0.01% v/v solution in ethanol.

Method

6. Place cold water (<10°C) in a blender cup. Add Metilgel powder. Blend on high speed for 90 seconds — the powder will not fully hydrate immediately.
7. Add riboflavin, NaCl, and aroma solution. Blend for a further 30 seconds.
8. Transfer to squeeze bottle. Refrigerate overnight (minimum 8 hours) — full hydration and gelation capacity only develops below 10°C with adequate resting time.
9. At service, remove squeeze bottle from refrigerator. The contents should be a viscous, pourable liquid at room temperature.
10. With serving bowl of broth at 85°C on the table, insert nozzle just below broth surface and draw continuous strands in a flowing motion. Noodles solidify in <3 seconds.
11. Serve immediately — noodles will soften and dissolve as broth cools below 50°C, so service must follow noodle formation within 3–4 minutes.

Sensory result: silky, slightly elastic strands with a clean, mild wheat-adjacent flavour from the 2-AP. Vivid yellow colour from riboflavin. The texture is not identical to wheat noodles

but is distinctive and texturally interesting. The live formation is the most theatrically compelling element of the dish.

2.2.2 Trial 2: Albuwhip Heat-Set Protein Noodles

The second approach explored the heat-coagulation of egg white protein (ovalbumin) as a noodle-forming mechanism, using Sosa's Albuwhip — a spray-dried egg white protein optimised for foaming and coagulation. A solution of Albuwhip in water can be piped into a hot medium (80°C broth) where ovalbumin denatures irreversibly at approximately 80°C, forming a continuous, firm protein strand. This method produces a noodle that does not dissolve, more closely resembling a traditional protein noodle in longevity.

Ingredients (per 100 ml noodle base)

Ingredient	Quantity	Brand / Supplier	Description / E-number
Albuwhip (egg white protein)	8.0 g	Sosa Ingredients	Ovalbumin, whipping and coagulation protein
Water (room temperature)	100 ml	—	Filtered water
Riboflavin	0.05 g	Sosa Ingredients	E101, colour
2-acetyl-1-pyrroline solution*	0.001 ml	Symrise	Aroma
Sodium chloride	0.10 g	—	Seasoning
Xanthan Gum	0.05 g	Sosa Ingredients	E415, adds extrusion viscosity

Method

12. Dissolve Albuwhip in water at room temperature. Whisk gently — do not foam. Add Xanthan Gum, riboflavin, NaCl, and aroma.
13. Load into squeeze bottle. No pre-chill required.
14. Pipe directly into broth at 85°C. Strands coagulate in 4–6 seconds and hold firm shape permanently.

Sensory result: noodles are firmer and hold their shape well in broth but had a slightly rubbery, egg-white character on tasting. The mouthfeel lacked the silkiness of Metilgel noodles. Formation time was slightly longer (5–6 seconds vs 2–3 seconds for Metilgel). Not selected as primary method but viable for a warmer-service bowl where noodle longevity is important.

2.2.3 Trial 3: Casein-Soy Composite Noodles

The third approach used a blend of sodium caseinate and Sosa's Sojawhip (soy protein isolate) with low-acyl Gellan Gum from Sosa to form thermally-stable protein noodles. This method does not require heating for setting — instead, low-acyl gellan gels on contact with divalent cations (Ca^{2+}). The noodle base is piped onto a surface lightly dusted with Sosa's Chlorure (calcium chloride), allowing immediate gelation from the outside inward.

Ingredients (per 100 ml noodle base)

Ingredient	Quantity	Brand / Supplier	Description / E-number
Sodium caseinate	5.0 g	Louis François	Milk protein fraction, E-number not applicable
Sojawhip (soy protein isolate)	3.0 g	Sosa Ingredients	Soy protein, emulsification and film formation
Gellan Gum (low-acyl)	0.30 g	Sosa Ingredients	E418, ionic gelation with Ca^{2+}
Water	100 ml	—	Filtered
Riboflavin	0.05 g	Sosa Ingredients	E101, colour
Sodium chloride	0.10 g	—	Seasoning
Chlorure ($CaCl_2$ setting bath)	dusting	Sosa Ingredients	E509, calcium chloride, ionic crosslinker

Method

15. Disperse Gellan Gum in 100 ml water with heating to 80°C. Stir until dissolved. Cool to 45°C.
16. Add sodium caseinate, Sojawhip, riboflavin, and NaCl. Blend smooth with immersion blender.
17. Pipe noodles onto a Chlorure-dusted surface (1% $CaCl_2$ powder). Gelation occurs within 5 seconds.
18. Carefully transfer set noodles to broth for service.

Sensory result: noodles had an excellent protein-rich mouthfeel and maintained integrity in broth indefinitely. However, the slight dairy note from caseinate conflicted with the clean umami broth, and the production method (off-plate noodle formation) was less theatrically effective than the live Metilgel method. Not selected as primary method.

Criterion	Metilgel (Trial 1)	Albuwhip (Trial 2)	Casein-Soy (Trial 3)	Winner
Texture / mouthfeel	★★★★★	★★★☆☆	★★★★☆	Trial 1
Flavour neutrality	★★★★★	★★★★☆	★★★☆☆	Trial 1
Theatricality (live)	★★★★★	★★★★☆	★★☆☆☆	Trial 1
Prep simplicity	★★★★☆	★★★★★	★★★☆☆	Trial 2
NbN purity	★★★★★	★★★★★	★★★★☆	Tie 1&2
SELECTED METHOD	**Trial 1 — Metilgel Thermoreversible Noodles (Sosa Ingredients)**			

1.3 Protein Chashu Tile

Traditional chashu is braised pork belly — high in saturated fat and the single largest caloric contributor in a ramen bowl (~120 kcal per slice). The NbN chashu uses soy protein isolate (Sojawhip) bonded with transglutaminase at room temperature to create a sliceable, protein-rich tile of comparable appearance, with a smoke-caramel aroma profile constructed from pure Maillard compounds.

1.3.1 Equipment

Small flat silicone mold (4×3×2 cm), precision balance, mixing bowl, spatula, refrigerator.

4.3.2 Ingredients (per 10 portions)

Ingredient	Quantity	Brand / Supplier	Description / E-number
Sojawhip (soy protein isolate)	8.0 g	Sosa Ingredients	Soy protein, film and gel formation
Sodium caseinate	2.0 g	Louis François	Milk protein, mouthfeel contribution
Transglutaminase (Activa EB)	0.3 g	Ajinomoto / Louis François	Enzyme, covalent protein bonding
Water	90 ml	—	Filtered
Guaiacol solution*	0.002 ml	Symrise	Smoke/wood-smoke aroma, E-number not required
Maltol solution*	0.003 ml	Symrise	Caramel/brown Maillard note
Erythritol	0.50 g	Sosa Ingredients	E968, low-calorie sweetener for glaze
Caramel colour E150a	0.05 g	Louis François	E150a, natural brown colouring
Riboflavin	0.01 g	—	E101, surface amber tint

* 0.01% v/v solutions in food-grade ethanol.

1.3.3 Method

19. Mix Sojawhip, sodium caseinate, and transglutaminase in 90 ml water. Blend until smooth.
20. Add aroma solutions and caramel colour. Mix gently to avoid foam.
21. Pour into flat silicone molds to a depth of 15 mm. Refrigerate at 4°C for 20 minutes — transglutaminase catalyses irreversible isopeptide bonds between glutamine and lysine residues during this rest.
22. Demold gently. Using a brush, apply a thin wash of erythritol + riboflavin dissolved in 5 ml warm water to the top surface. This creates the characteristic caramelised appearance of chashu without any heating.
23. Slice into 4×3 cm tiles, 1 cm thick, for service.

1.4 NbN Soft Egg

The marinated soft-boiled egg (ajitsuke tamago) is visually iconic in ramen: a white albumen with a glistening, deep-orange yolk. The NbN egg deconstructs this into two gelled systems: the white from Albuwhip (ovalbumin), set with Kappa Gum from Sosa, and the yolk from Sosa's Gellan Gum tinted with beta-carotene and scented with delta-decalactone — the principal volatile of egg yolk.

1.4.1 Equipment

Half-sphere silicone molds (3.5 cm diameter), small sphere mold (1.5 cm diameter), precision balance, small saucepan, thermometer.

1.4.2 Ingredients (per 10 eggs)

Ingredient	Quantity	Brand / Supplier	Description / E-number
Albuwhip (egg white protein)	6.0 g	Sosa Ingredients	Ovalbumin protein fraction
Kappa Gum (κ-carrageenan)	0.8 g	Sosa Ingredients	E407, heat-set gel, firm texture
Water (white)	100 ml	—	For white gel
Gellan Gum (low-acyl)	0.30 g	Sosa Ingredients	E418, clear firm yolk gel
Water (yolk)	30 ml	—	For yolk gel
Beta-carotene	0.005 g	Sosa Ingredients	E160a, deep orange yolk colour
Steviol glycoside	trace	Sosa Ingredients	E960, minimal sweetness for yolk
Delta-decalactone solution*	0.001 ml	Symrise	Egg yolk / creamy aroma compound

1.4.3 Method

24. White: dissolve Kappa Gum and Albuwhip in 100 ml water. Heat to 80°C, stir until fully dissolved. Pour into half-sphere molds. Cool to set (firm, white, opaque). Unmold carefully.
25. Yolk: heat 30 ml water to 80°C. Dissolve Gellan Gum and beta-carotene. Add steviol glycoside and delta-decalactone. Pour into small sphere molds (1.5 cm diameter). Cool to set (glossy, deep orange sphere).
26. Assembly: place one yolk sphere on a set white half-sphere. Top with second white half. Seal edge with a tiny drop of warm Kappa Gum solution. Allow to re-set at room temperature for 5 minutes.
27. Slice through the equator for service to reveal the orange yolk — or serve whole and allow the diner to cut.

1.5 NbN Nori Sheet

Real nori (dried seaweed) derives its characteristic flavour from high free glutamate content, dimethyl sulfide (marine/ocean aroma), sodium chloride, and dark green-black pigmentation from chlorophylls. The NbN nori replicates this using Sosa's Agar-Agar as the matrix, spirulina powder for colour and texture, and a carefully dosed DMS note to evoke the sea without tipping into cooked-cabbage territory.

1.5.1 Ingredients (per 20 sheets)

Ingredient	Quantity	Brand / Supplier	Description / E-number
Pure Agar-Agar	1.50 g	Sosa Ingredients	E406, seaweed polysaccharide, firm transparent gel
Water	100 ml	—	Filtered
Spirulina powder (natural colour)	0.40 g	Sosa Ingredients	Blue-green-black colour, trace protein
Monosodium glutamate	0.30 g	Louis François	E621, dominant nori taste compound
Sodium chloride	0.05 g	—	NaCl, seasoning
Dimethyl sulfide solution*	0.001 ml	Symrise	Marine/seaweed aroma, DMS at <0.001 ml/100 ml

1.5.2 Method

28. Combine Agar-Agar, spirulina, MSG, and NaCl in 100 ml water. Heat to 95°C while whisking until fully dissolved.
29. Remove from heat. Add DMS solution with micropipette. Stir 5 seconds.
30. Pour onto a flat tray lined with food film to a depth of 1.5 mm. Spread evenly with an offset spatula.
31. Cool at room temperature until set (approximately 4 minutes). Cut into 5×8 cm sheets with a sharp knife or cutter.
32. Sheets can be prepared in advance and held at room temperature for up to 4 hours without quality loss.

1.6 Menma (NbN Bamboo Shoots)

Menma are fermented bamboo shoots with a characteristic fibrous, springy texture and a mildly savoury, slightly woody flavour. The NbN version exploits the unique synergistic gel formed by combining Sosa's Kappa Gum with konjac glucomannan — a combination that produces a notably fibrous, resilient texture closely mirroring bamboo. Hexanal provides the dominant green/woody volatile note of raw bamboo.

1.6.1 Ingredients (per 10 portions)

Ingredient	Quantity	Brand / Supplier	Description / E-number
Kappa Gum (κ-carrageenan)	1.00 g	Sosa Ingredients	E407, rigid gel base
Konjac glucomannan	0.30 g	Louis François / MSK	E425, fibrous, springy gel modifier
Water	100 ml	—	Filtered
Sodium chloride	0.10 g	—	Seasoning
Citric acid	0.005 g	Louis François	E330, mild acidity (tang of fermented bamboo)
Hexanal solution*	0.002 ml	Symrise	Green/woody bamboo shoot aroma
Beta-carotene	0.002 g	Sosa Ingredients	E160a, pale gold colour

1.6.2 Method

33. Dissolve Kappa Gum and konjac in 100 ml water. Heat to 80°C while stirring continuously — the blend thickens significantly. Add NaCl, citric acid, and beta-carotene.
34. Remove from heat. Add hexanal solution with micropipette.
35. Pour into a flat tray to 8 mm depth. Cool until firm.
36. Cut into strips 3 cm long × 8 mm wide. The konjac-carrageenan gel shreds slightly under cutting, producing a fibrous cross-section visually and texturally reminiscent of bamboo fibre.

1.7 Narutomaki (NbN Fish Cake with Pink Spiral)

Narutomaki is the instantly recognisable white fish-cake disc with a pink spiral cross-section, synonymous with Japanese ramen. It represents the most technically demanding visual element of this dish, requiring precise two-gel laminate timing. The white layer uses Sosa's Kappa Gum; the pink spiral uses Sosa's Iota Pro Pannacotta (ι-carrageenan), which gels at a lower temperature, allowing sequential piping before full setting.

1.7.1 Equipment

Circular silicone mold (4 cm diameter, 1.5 cm depth), piping bag with 3 mm nozzle, thermometer, precision balance.

4.7.2 Ingredients (per 10 pieces)

Ingredient	Quantity	Brand / Supplier	Description / E-number
Kappa Gum (κ-carrageenan)	1.00 g	Sosa Ingredients	E407, white disc base — sets at ~40°C
Iota Pro Pannacotta (ι-carrageenan)	0.80 g	Sosa Ingredients	E407, pink spiral — elastic, sets at ~35°C
Water	120 ml	—	Split: 80 ml white, 40 ml pink
Betanin (beet red extract)	0.02 g	Sosa Ingredients	E162, vivid pink pigment
Isoamyl acetate solution*	0.001 ml	Symrise	Mild fruity/fish-cake aroma note
Sodium chloride	0.10 g	—	Seasoning (both layers)

1.7.3 Method

37. White base: dissolve Kappa Gum in 80 ml water, heat to 80°C, add NaCl and isoamyl acetate. Pour into circular molds to a depth of 12 mm. Cool to 43°C (watch thermometer carefully).
38. Pink spiral: simultaneously dissolve Iota Pro Pannacotta in 40 ml water, heat to 80°C. Add betanin and NaCl. Cool to 40°C.
39. When white base has reached 43°C and is beginning to skin over at the surface (but still soft below), load pink gel into piping bag and pipe a tight Archimedean spiral across the surface of each disc. Work quickly.
40. Cap immediately with a thin 3 mm pour of white Kappa Gum solution (at ~45°C). This seals the spiral between layers.
41. Refrigerate for 10 minutes until fully set. Unmold and slice through the equator — the pink spiral is revealed in perfect cross-section.

1.8 Chili Tare Oil Drops

Tare is ramen's concentrated seasoning base, typically containing soy sauce, mirin, and fat. The NbN version constructs a chili-scented oleic acid emulsion coloured with beta-carotene and dosed with capsaicin for measured heat, dropped onto the broth surface as glossy orange pools that float by density difference and dissolve slowly for a sustained trigeminal effect.

1.8.1 Ingredients (per 10 portions, approx. 5 ml total)

Ingredient	Quantity	Brand / Supplier	Description / E-number
Oleic acid (food grade)	5.0 ml	Louis François / Breko	Pure C18:1 fatty acid, liquid at room temp
Capsaicin solution (0.1%)	0.05 ml	Symrise	Trigeminal heat, active 0.002% final concentration
2-acetylpyrazine solution*	0.003 ml	Symrise	Roasted/nutty aroma
Guaiacol solution*	0.002 ml	Symrise	Smoke note
Beta-carotene	0.010 g	Sosa Ingredients	E160a, deep red-orange colour
Soy lecithin	0.10 g	Sosa Ingredients	E322, emulsifier for surface stability

4.8.2 Method

42. Warm oleic acid to 40°C. Add beta-carotene and stir until dissolved.
43. Add capsaicin solution, aroma solutions, and lecithin. Stir to combine.
44. At service, using a dropper or small spoon, place 3–5 drops (3–4 mm diameter) on the broth surface. They will spread slightly and sit as glossy orange pools.

1.9 Green Onion Foam

Scallion (spring onion) foam provides the vivid green visual accent of the dish. Propanethial S-oxide, at extreme dilution (<0.001 ml/100 ml), delivers the characteristic pungent onion note without irritation; cis-3-hexenol adds freshness. Sosa's Prosoufflé is used as the whipping protein base for an exceptionally stable foam that holds its shape for service.

1.9.1 Ingredients (per 100 ml base, yields 20 portions)

Ingredient	Quantity	Brand / Supplier	Description / E-number
ProSoufflé (whipping protein)	3.0 g	Sosa Ingredients	Soy protein-based whipping agent, fine stable foam
Gellan Gum (low-acyl)	0.10 g	Sosa Ingredients	E418, stabilises foam structure
Water	100 ml	—	Filtered
Spirulina (natural colour)	0.10 g	Sosa Ingredients	Vivid green pigment
Propanethial S-oxide solution*	0.0005 ml	Symrise	Onion pungency — extremely potent, handle with care
cis-3-Hexenol solution*	0.002 ml	Symrise	Fresh green/grassy note

1.9.2 Method

45. Dissolve Gellan Gum in 100 ml water at 60°C. Cool to 40°C. Add ProSoufflé, spirulina, and aroma solutions.
46. Whip using a hand mixer or kitchen siphon (N_2O cartridge) to stiff foam. The Gellan stabilises air cells — foam holds structure for 30+ minutes at room temperature.
47. Pipe small irregular mounds (~1 cm diameter) directly onto the assembled bowl surface just before service.

1.10 Sesame Isomalt Pearls

Toasted sesame seeds contribute crunch, visual detail, and a key roasted aroma note. The NbN version casts isomalt microspheres carrying 2-furfurylthiol (the dominant roasted sesame compound, also present in coffee and popcorn) and 2-acetylpyrazine. The pearls visually mimic sesame seeds but shatter on contact with the tongue, releasing an intense aroma burst — far more impactful than a real sesame seed of equivalent volume.

1.10.1 Ingredients (per 50 pearls, yields 10 portions)

Ingredient	Quantity	Brand / Supplier	Description / E-number
Isomalt	10.0 g	Sosa Ingredients	E953, low-calorie sugar alcohol, thermoplastic
2-Furfurylthiol solution*	0.002 ml	Symrise	Roasted sesame/coffee aroma, active at ppb
2-Acetylpyrazine solution*	0.003 ml	Symrise	Nutty Maillard note
Titanium dioxide (E171)	trace	Sosa Ingredients	E171, white pigment for some pearls
Beta-carotene	trace	Sosa Ingredients	E160a, amber pigment for other pearls

1.10.2 Method

48. Melt isomalt to 150°C in a small saucepan. Remove from heat. Cool to 130°C.
49. Divide into two batches: add titanium dioxide to one (white pearls), beta-carotene to the other (amber pearls).
50. Add aroma solutions to both batches. Stir carefully.
51. Using a fine-tipped dropper or toothpick, drip 2 mm hemispheres onto silicone mat. Cool 30 seconds to hard spheres.
52. Scatter 6–8 pearls over assembled bowl just before service.

2.1 Assembly Sequence and Timing (10-minute window)

Time	Action	Outcome
T−1 day	Prepare Metilgel noodle base. Refrigerate overnight.	Noodle base ready (passive)
T−20 min	Prepare chashu, set in fridge. Prepare nori sheets.	Components ready
T−10 min	Prepare NbN egg halves. Prepare menma, narutomaki.	All toppings complete
T−5 min	Mix ghost stock. Warm serving bowl.	Broth at 80°C
T−3 min	Foam green onion. Drop tare oil. Add narutomaki, nori, menma, chashu, egg.	Bowl assembled
T−0	Form Metilgel noodles live in broth at table. Scatter sesame pearls. Serve.	Full 10-min demo complete

2.2 Calorie Comparison

Calorie values for the NbN dish were calculated from known caloric densities of each pure compound. Values for the traditional tonkotsu bowl are drawn from standard nutritional databases (USDA FoodData Central, 2024; CIQUAL, 2024) for a typical restaurant-grade serving.

Component	NbN Ingredients	NbN kcal	Traditional Equivalent	Trad. kcal
Ghost stock (broth)	MSG 0.6g, IMP 0.2g, xanthan 0.05g	~3	Traditional tonkotsu (12h bone broth, 300 ml)	~35
Metilgel noodles	Metilgel 2g, riboflavin trace	~5	Wheat ramen noodles (100g dry)	~350
Protein chashu tile	Sojawhip 8g, caseinate 2g, erythritol 0.5g	~12	Pork belly chashu (30g)	~120
NbN egg	Albuwhip 6g, kappa gum 0.8g, gellan 0.3g	~8	Marinated soft-boiled egg (1 medium, 50g)	~70
NbN nori sheet	Agar 1.5g, spirulina 0.4g, MSG 0.3g	~4	Dried nori sheet (3g)	~9
Menma (bamboo gel)	Kappa 1g, konjac 0.3g, citric acid trace	~2	Fermented bamboo shoots (20g)	~6
Narutomaki	Kappa 1g, iota 0.8g, betanin trace	~3	Fish cake narutomaki (20g)	~30
Chili tare oil drops	Oleic acid 0.5ml, capsaicin trace	~4	Chili oil tare (5ml, sesame oil base)	~40
Green onion foam	ProSoufflé 3g, gellan 0.1g	~3	Spring onions (10g)	~3
Sesame isomalt pearls	Isomalt 1g, aroma trace	~3	Toasted sesame seeds (3g)	~17
TOTAL PER BOWL	**All NbN components, 1 portion**	**~47 kcal**	**Traditional tonkotsu ramen**	**~680 kcal**

The NbN bowl delivers approximately 47 kcal against 680 kcal for a comparable traditional tonkotsu bowl — a 93% caloric reduction. Cost per NbN bowl: approximately €0.28 versus

€3.50–€5.00 for restaurant-grade tonkotsu ingredients. Active preparation time: 9 minutes versus 14+ hours for traditional broth alone.

Conclusion

NbN Ramen demonstrates that the most globally recognisable bowl meal can be entirely reconstructed from pure compounds without significant loss of sensory experience, and with dramatic gains on all three axes of the 14th contest theme. A 93% reduction in caloric content (47 kcal versus ~680 kcal), a tenfold reduction in cost (€0.28 versus ~€3.50), and a collapse in preparation time from 14+ hours to under 9 active minutes represent among the most extreme reductions achievable through NbN methodology for a dish of this visual and sensory complexity.

8. References

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