

Nutrition.io

Clinical Review Pack — Calculation Logic & Interaction Tables

Prepared for independent review by a registered dietitian. Estimated time: about 1 hour — this is a scan for anything unsafe or overstated, not a from-scratch audit. Mapped as roughly 12 min (Part 1) + 10 min (Part 2) + 30 min (Part 3, incl. the food table) + 5 min (sign-off).

September 2026 · nutrition.io · help@nutrition.io

What you are reviewing

- Part 1 — the metabolic calculation engine behind the paid assessment: every formula, threshold and safety floor, with two fully worked examples already computed for reference.
- Part 2 — the levothyroxine timing tool: all 21 separation intervals, the evidence label on each, and the rule that merges them into one safe time.
- Part 3 — a set of Hashimoto's/PCOS/SIBO content pages and the 27-food cross-diet checker table.

How this was built

- Every figure a user sees is computed in code from the published equations cited in the Sources section — never estimated by a language model. The model writes prose around fixed numbers; it cannot change them.
- Nothing here is a diagnosis, a dose recommendation, or a promise of an outcome. Where guidance varies, the more conservative option is used and the document says so.
- Your name will be attached only to the items you approve on the final sign-off sheet — nothing else on the site.
- Scope is exact, not implied: this sign-off covers only the calculation logic in Parts 1–2 and the specific pages listed in Part 3, exactly as they read today. It does not cover the rest of the site, future edits, or marketing copy — if something changes after you sign, it is re-reviewed before the name stays attached to it.

Where AI is used, and where it is not

Read this before Part 1. It sets out exactly which parts of the product are fixed code and which parts involve a language model, so you know what you are signing off on.

No AI model estimates our nutrition numbers, medication intervals, or calorie targets. Every figure is calculated in code using published clinical equations (Mifflin-St Jeor, IOM AMDR, ATA guidance) and fixed rules. The same inputs always return the same outputs.

Component	AI involved?	How the output is produced
Levothyroxine timing checker	No — none	Runs entirely in the reader's browser from a fixed table of 21 intervals. No model call, no server call, nothing stored.
Food checker (27 foods)	No — none	Fixed verdict table per diet, with conflicts and raw-vs-cooked notes written in advance and cited.
Metabolic engine (RMR, TDEE, target, macros, fibre, fluid, meals, projection)	No — none	A pure calculation module. The server recomputes from the stored answers rather than trusting the browser, so the two must agree.
Report wording around the numbers	Yes — wording only	A model writes the explanatory prose. The figures are inserted from the calculation above and the model cannot alter them.
Article and guide text	Yes — drafting, with human review	Drafted with AI assistance against peer-reviewed sources, then checked by the editorial team before publishing. Bylined 'Nutrition.io Editorial Team', never a fabricated clinician.

- Determinism means the same person entering the same answers on any day, on any device, receives the identical target — there is no sampling, no temperature, no drift.
- Every threshold, cap and safety floor in Part 1 is a hard-coded constant you can check line by line; if you flag one as unsafe, it is changed in one place and applies to everyone immediately.
- Free-text a user writes about their condition or medication is read as context only. It never changes a calculated figure, and the product says plainly when a question belongs with their doctor.

Part 1 — The metabolic calculation engine

About 12 minutes. Seven steps, computed in this order. Each step lists its source; full links are in the Sources section. After the steps, two worked examples show the exact arithmetic a user receives.

Step 1 — Resting metabolic rate ([Mifflin-St Jeor, Am J Clin Nutr 1990](#))

Men: $\text{RMR} = 10 \times \text{weight}(\text{kg}) + 6.25 \times \text{height}(\text{cm}) - 5 \times \text{age} + 5$

Women: $\text{RMR} = 10 \times \text{weight}(\text{kg}) + 6.25 \times \text{height}(\text{cm}) - 5 \times \text{age} - 161$

Gender not disclosed: midpoint constant -78, with a wider-margin caveat shown to the user

Note: Mifflin-St Jeor is the equation recommended by the Academy of Nutrition and Dietetics over Harris-Benedict for adults.

Step 2 — Daily expenditure ([FAO/WHO/UNU activity multipliers, 2004](#))

$\text{TDEE} = \text{RMR} \times \text{activity level}$

Sedentary 1.2 | Light 1.375 | Moderate 1.55 | Active 1.725

Step 3 — Calorie target (goal adjustment with two safety floors)

Lose: deficit = the SMALLER of 20% of TDEE or 500 kcal/day

Gain: surplus = the SMALLER of 10% of TDEE or 300 kcal/day

Floor 1: target never below resting metabolic rate

Floor 2: target never below 1500 kcal (men) / 1200 kcal (women)

If a floor applies, the user is told their target was raised and why.

Step 4 — Protein ([IOM DRI 2005](#); [ISSN 2017](#); [Helms 2014](#))

Cutting 1.6 g/kg | Gaining 1.8 g/kg | Maintaining 1.2 g/kg | High-protein 2.0 g/kg

Clamped between 0.8 g/kg (RDA floor) and 2.2 g/kg

BMI ≥ 30 : dosed on ADJUSTED body weight = weight at BMI 22.5 + 0.4 x excess,

because fat tissue does not carry the same protein need as lean tissue (ASPEN/ESPEN practice).

Step 5 — Fat and carbohydrate ([IOM AMDR](#))

Fat: 30% of energy (35% Mediterranean), never below 20% — needed for fat-soluble vitamins A, D, E, K.

Carbohydrate takes the remainder of energy after protein and fat.

1. Cayla Jablonski

October 7, 2026 at 10:38:48 AM

I would recommend higher (more like 8-10g/meal for women and 10-15g/meal for men) This keeps the complex carbs higher and simple carbs down. Also make sure that no one is getting all of their fiber in one sitting. It could be a rule that no matter how many calories a person needs a day, women need at least 25g of fiber/day and men 38g per the RDA (personally think they need to increase this to prevent colon cancer)
2. Cayla Jablonski

October 7, 2026 at 10:41:13 AM

This would then run higher.

Low-carbohydrate preference: carbohydrate deliberately set at 20%, stated to the user as a deliberate departure from the 45–65% reference range, not hidden.

Guard: if carbohydrate would go negative, protein steps back toward the RDA.

Step 6 — Fibre, fluid and meals

- 1 Fibre: 14 g per 1000 kcal (IOM)
- Fluid: 33 mL per kg body weight (ESPEN, 30–35 mL/kg/day)
- Meals: window <= 6 h -> 2 meals | <= 10 h -> 3 | otherwise 4
- Per-meal protein target: 0.4 g/kg (Moore 2015) — if below, the user is told fewer, larger servings would do more for muscle protein synthesis.

Step 7 — Rate-of-change projection (Wishnofsky 1958)

Projected change = (target - TDEE) x 7 / 7700, in kg per week,

stated to the user as a linear approximation — honest over weeks, optimistic over months.

Worked example A — weight loss, safety floor triggered

Quantity	Calculation and result
Input	Woman, 42, 78 kg, 165 cm, sedentary (1.2), goal “lose weight”, 10 h eating window
BMI	$78 / 1.65^2 = 28.7$ (overweight)
RMR	$10 \times 78 + 6.25 \times 165 - 5 \times 42 - 161 = 1440.3$ kcal
TDEE	$1440.3 \times 1.2 = 1728.3$ kcal
Deficit	$\min(500, 20\% \times 1728.3 = 345.7) = -345.7 \rightarrow 1382.6$ kcal
Floor applied	$1382.6 < \text{RMR } 1440.3 \rightarrow$ target RAISED to 1440.3 kcal; user told faster loss is a medically supervised decision
Protein	$1.6 \times 78 = 124.8$ g (499.2 kcal, 34.7%)
Fat	$30\% = 432.1$ kcal = 48.0 g
Carbohydrate	Remainder: 509.0 kcal = 127.2 g (35.3%)
Fibre / fluid	20.2 g / 2574 mL2
Meals	3 $\rightarrow$ 41.6 g protein per meal, above the 31.2 g per-meal threshold
Projection	$(1440.3 - 1728.3) \times 7 / 7700 = -0.26$ kg per week

Worked example B — muscle gain

Quantity	Calculation and result
Input	Man, 30, 70 kg, 180 cm, active (1.55), goal “gain muscle”, 12 h eating window
BMI	$70 / 1.8^2 = 21.6$ (normal weight)
RMR	$10 \times 70 + 6.25 \times 180 - 5 \times 30 + 5 = 1680.0$ kcal
TDEE	$1680.0 \times 1.55 = 2604.0$ kcal
Surplus	$\min(300, 10\% \times 2604.0 = 260.4) = +260.4 \rightarrow$ target 2864.4 kcal (no floor needed)
Protein	$1.8 \times 70 = 126.0$ g (504 kcal, 17.6%)
Fat	$30\% = 859.3$ kcal = 95.5 g
Carbohydrate	Remainder: 1501.1 kcal = 375.3 g (52.4%)
Fibre / fluid	40.1 g / 2310 mL
Meals	4 $\rightarrow$ 31.5 g protein per meal, above the 28.0 g per-meal threshold
Projection	$(2864.4 - 2604.0) \times 7 / 7700 = +0.24$ kg per week

Caveats the user is shown verbatim

These are printed on every result, word for word:

- Where a floor applies: “Your calorie target was raised to [X] kcal. A larger deficit would have put you below [X] kcal, which is under your resting requirement and below the level at which a diet reliably meets vitamin and mineral needs from food alone. Faster loss than this is a medically supervised decision, not a self-directed one.”
- Where BMI is 30 or above: protein is prescribed on adjusted body weight, with the reason stated.
- Where per-meal protein falls below the 0.4 g/kg threshold: the user is told fewer, larger servings do more.
- On every plan: “These figures are predictive equations, not measurements. Individual resting expenditure varies by roughly plus or minus 10% around the prediction, so treat them as a starting point and let two weeks of real-world response tune them.”

Questions for you

- Scan Part 1 for one thing: any threshold, cap or floor that looks wrong or unsafe. Nothing to flag = approve as-is. **Nothing unsafe, would increase fiber needs to at least match RDA instead of being based on calories.**
- Is any caveat missing that you would state out loud to a patient? **You may be ahead of me on this but I would really push for whole food sources over powders/supplements (ie protein bars and fiber gummies)**
- Does anything read as diagnosis, or as a clinical outcome claim, rather than a nutrition target? **No**

Part 2 — Levothyroxine timing logic

About 10 minutes.

Sources for the intervals below:

- [ATA hypothyroidism treatment guidelines — Jonklaas 2014](#)
- [Coffee interaction — Benvenga 2008](#)
- [Calcium carbonate interaction — Singh 2000](#)
- [Iron interaction — Campbell 1992](#)
- [Soy interaction — Messina & Redmond 2006](#)

The tool takes one input — the time the person takes their dose, with a bedtime-dosing toggle — and the items they tick. For each ticked item it applies the separation below, then merges overlapping waits into one combined “safe from” clock time (dose time + longest applicable interval), so the user sees one headline instead of five conflicting blocks. Items whose issue is laboratory testing rather than absorption (biotin) appear in a separate callout and are never blended into the timing table. A disclaimer sits directly under the headline result: this is general guidance, not a dose change, and the prescriber’s instruction overrides it.

3

Item	Category	Separation	Evidence	Why
Plain water	Drinks	None	Well documented	Water is how levothyroxine is meant to be taken.
Coffee (including black)	Drinks	60 min after	Well documented	Coffee with or shortly after the tablet measurably lowers absorption. Guidance varies 30–60 min; 60 is used as the safer default.
Coffee or tea with milk	Drinks	4 h	Reasonably documented	Coffee effect plus calcium from milk, which binds levothyroxine — treated as a calcium source.
Black or green tea	Drinks	60 min	Limited — cautious default	Less studied than coffee; same practical caution in the first hour.
Grapefruit juice	Drinks	60 min	Reasonably documented	Modestly reduces absorption in controlled studies; usually a small effect.
Breakfast or any food	Food	30 min	Well documented	Best absorbed on an empty stomach. 30 min is the usual minimum; 60 is better.
High-fibre meal or fibre supplement	Food	4 h	Reasonably documented	Fibre and bulking agents bind levothyroxine in the gut.
Soy foods (tofu, soy milk, soy protein)	Food	4 h	Reasonably documented	Reduces absorption; advice is consistency and separation, not elimination.
Walnuts	Food	4 h	Limited — cautious default	Case-literature reports only; cautious default rather than a firm rule.
Milk, yoghurt or cheese	Food	4 h	Well documented	A calcium source; belongs in the four-hour group.

Item	Category	Separation	Evidence	Why
Calcium supplement or fortified drink	Suppl.	4 h	Well documented	Calcium carbonate forms an insoluble complex with levothyroxine.
Iron supplement	Suppl.	4 h	Well documented	Iron binds levothyroxine directly; separation, not avoidance — low ferritin is worth correcting.
Multivitamin containing iron or calcium	Suppl.	4 h	Well documented	Most carry both main binders; label check advised.
Magnesium supplement	Suppl.	4 h	Reasonably documented	Magnesium salts reduce absorption like calcium.
Selenium supplement	Suppl.	None	Reasonably documented	No documented absorption interaction; safe upper intake applies.
Vitamin D supplement	Suppl.	None	Reasonably documented	No timing interaction alone; combined Ca+D tablets follow the calcium rule.
Biotin (hair/skin/nail formulas)	Suppl.	LAB FLAG ONLY	Well documented	Does not change absorption but distorts thyroid lab assays. Callout, not a timing row: stop ≥ 48 h before a thyroid blood test or tell the lab.
Proton pump inhibitor (omeprazole, pantoprazole)	Meds.	4 h + prescriber note	Reasonably documented	Reduced stomach acid can lower absorption; users told some people also need a dose review — ask the prescriber.
Antacids (aluminium/magnesium)	Meds.	4 h	Well documented	Bind levothyroxine directly in the gut.
Bile acid binders (cholestyramine, colestesvelam)	Meds.	4 h	Well documented	Among the strongest binders; users told to follow prescriber instruction over the tool.
Phosphate binders (sevelamer, lanthanum)	Meds.	4 h	Reasonably documented	Bind levothyroxine; monitor thyroid labs.

Questions for you

- Scan Part 2 for one thing: any separation window that looks wrong or unsafe. Nothing to flag = approve as-is. **Nothing**
- Is any common item missing? **Not that I can think of!**
- Is any evidence label overstated? **No, I definitely see more safe guards on this than not and for good reason.**
- Is the merged single-window rule safe as a default? **Yes**

Part 3 — Content spot-checks

About 30 minutes for the 7 pages below plus the food table. This is a deliberately short, named list — the highest-traffic and highest-liability pages on the site, not a random sample and not a claim that every page has been reviewed.

- Hashimoto's foods to avoid — <https://nutrtion.io/learn/hashimotos-foods-to-avoid>
- Hashimoto's supplements guide — <https://nutrtion.io/learn/hashimotos-supplements-guide>
- Hashimoto's diet plan — <https://nutrtion.io/learn/hashimotos-diet-plan>
- Benchmark methodology — <https://nutrtion.io/metabolic-assessment/accuracy>

Tier 1 — highest traffic / highest priority:

- Hashimoto's 14-day meal plan — <https://nutrtion.io/learn/hashimotos-14-day-meal-plan>
- SIBO diet — <https://nutrtion.io/learn/sibo-diet>
- Hashimoto's 7-day meal plan — <https://nutrtion.io/learn/hashimotos-7-day-meal-plan>

Skim each for one thing: anything phrased as a promised outcome or a diagnosis. Flag the exact line — no rewriting needed.

On the benchmark methodology page specifically: does the disclosure read as honest to you — clear that this is not CDR-administered or endorsed, and that it does not claim to equal or beat a human dietitian? Flag anything that overstates what the benchmark shows.

The 27-food cross-diet checker table

Each food carries a verdict per diet. “Depends” means portion or preparation decides. The most valuable rows are where the three diets disagree. A raw-vs-cooked note is shown in the tool for the goitrogenic vegetables; cooking deactivates much of the goitrogenic activity.

Food	AIP	SIBO / low-FODMAP	Hashimoto's	Key note
Chicken (thigh or breast)	Allowed	Allowed	Allowed	Neutral, useful protein; no levothyroxine interaction.
Broccoli	Allowed	Depends	Depends	Goitrogenic mainly in large raw intakes with low iodine; cooking deactivates much of it.
Cauliflower	Allowed	Avoid	Depends	High mannitol (SIBO); goitrogenic raw — cooking helps thyroid side, not mannitol.
Brussels sprouts	Allowed	Depends	Depends	Low-FODMAP ~1/2 cup; roasted/steamed is the thyroid-friendly form.

Food	AIP	SIBO / low-FODMAP	Hashimoto's	Key note
Kale	Allowed	Allowed	Depends	Daily large raw servings (smoothies) are goitrogenic; cooked is the easy default.
Cabbage	Allowed	Depends	Depends	Low-FODMAP ~3/4 cup; cooked is the simpler daily choice.
Soy (tofu, tempeh, edamame, soy milk)	Avoid	Avoid	Avoid	Reduces levothyroxine absorption — keep consistent, separate from dose by ~4 h.
Tomatoes	Avoid	Allowed	Depends	Nightshade (AIP); thyroid: test individually, no blanket rule.
White potatoes	Avoid	Allowed	Depends	Nightshade (AIP); fine for most people with Hashimoto's.
Bell peppers	Avoid	Allowed	Depends	Nightshade (AIP); restrict only on a tested personal sensitivity.
Garlic	Allowed	Avoid	Allowed	High fructans; garlic-infused oil is the workaround. No thyroid concern.
Onions	Allowed	Avoid	Allowed	High fructans; green spring-onion tops are fine. No thyroid concern.
Eggs	Avoid	Allowed	Allowed	Useful selenium, iodine and vitamin D; space from the dose like any food.
Cashews	Avoid	Avoid	Allowed	GOS even in small servings (SIBO); neutral for thyroid.
Almonds	Avoid	Depends	Allowed	~10 nuts tolerated (SIBO); neutral for thyroid.
Brazil nuts	Avoid	Depends	Depends	Densest selenium source — 1–2/day covers needs; more risks excess.
Coffee	Depends	Allowed	Depends	Within an hour of levothyroxine measurably reduces absorption; wait 30–60 min.
Dairy (milk, cheese, yogurt)	Avoid	Depends	Depends	Lactose is the SIBO issue; calcium binds levothyroxine — separate ~4 h.
Wheat and gluten grains	Avoid	Avoid	Depends	Test for coeliac disease before removing gluten; evidence mixed otherwise. ⁴
Beans, lentils and chickpeas	Avoid	Avoid	Allowed	Galactans (SIBO); useful iron/fibre — separate iron-rich meals from dose.
Quinoa	Avoid	Allowed	Allowed	Practical gluten-free carbohydrate.
Sweet potato	Allowed	Depends	Allowed	Low-FODMAP ~1/2 cup; no thyroid issue.
Salmon (wild-caught)	Allowed	Allowed	Allowed	Omega-3s, vitamin D and selenium — one of the easiest additions.

Food	AIP	SIBO / low-FODMAP	Hashimoto's	Key note
Seaweed and kelp	—	—	Avoid	Kelp can deliver thousands of µg iodine; excess iodine can worsen autoimmune thyroid disease.
Bone broth	Allowed	Allowed	Allowed	Fine if made without onion or garlic.
Turmeric	Allowed	Allowed	Allowed	No thyroid-specific concern at food-level intakes.
Avocado	Allowed	Depends	Allowed	Low-FODMAP ~1/8 whole; neutral fat source.

Sources

Every citation above, linked. PubMed links resolve to the abstract with full citation details.

1. Mifflin MD, St Jeor ST, et al. A new predictive equation for resting energy expenditure in healthy individuals. *Am J Clin Nutr* 1990;51:241-247 — <https://pubmed.ncbi.nlm.nih.gov/2305711/>
2. FAO/WHO/UNU. Human Energy Requirements. Report of a Joint Expert Consultation, 2004 — <https://www.fao.org/4/y5686e/y5686e00.htm>
3. WHO. Obesity: preventing and managing the global epidemic. Technical Report Series 894, 2000 — <https://www.who.int/publications/i/item/9241208942>
4. Institute of Medicine. Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids. National Academies Press, 2005 — <https://nap.nationalacademies.org/catalog/10490/dietary-reference-intakes-for-energy-carbohydrate-fiber-fat-fatty-acids-cholesterol-protein-and-amino-acids>
5. Jäger R, et al. International Society of Sports Nutrition Position Stand: protein and exercise. *JISSN* 2017;14:20 — <https://pubmed.ncbi.nlm.nih.gov/28642676/>
6. Helms ER, et al. A systematic review of dietary protein during caloric restriction in resistance trained lean athletes. *IJSNEM* 2014;24:127-138 — <https://pubmed.ncbi.nlm.nih.gov/24092765/>
7. Moore DR, et al. Protein ingestion to stimulate myofibrillar protein synthesis requires greater relative protein intakes in healthy older versus younger men. *J Gerontol A* 2015;70:57-62 — <https://pubmed.ncbi.nlm.nih.gov/25056502/>
8. Volkert D, et al. ESPEN guideline on clinical nutrition and hydration in geriatrics. *Clin Nutr* 2019;38:10-47 — <https://pubmed.ncbi.nlm.nih.gov/30005900/>
9. Wishnofsky M. Caloric equivalents of gained or lost weight. *Am J Clin Nutr* 1958;6:542-546 — <https://pubmed.ncbi.nlm.nih.gov/13594881/>
10. Jonklaas J, et al. Guidelines for the treatment of hypothyroidism: ATA task force on thyroid hormone replacement. *Thyroid* 2014;24:1670-1751 — <https://pubmed.ncbi.nlm.nih.gov/25266247/>
11. Benvenga S, et al. Altered intestinal absorption of L-thyroxine caused by coffee. *Thyroid* 2008;18:293-301 — <https://pubmed.ncbi.nlm.nih.gov/18341376/>
12. Singh N, et al. Effect of calcium carbonate on the absorption of levothyroxine. *JAMA* 2000;283:2822-2825 — <https://pubmed.ncbi.nlm.nih.gov/10838651/>
13. Campbell NR, et al. Ferrous sulfate reduces thyroxine efficacy in patients with hypothyroidism. *Ann Intern Med* 1992;117:1010-1013 — <https://pubmed.ncbi.nlm.nih.gov/1443969/>
14. Messina M, Redmond G. Effects of soy protein and soybean isoflavones on thyroid function in healthy adults and hypothyroid patients. *Thyroid* 2006;16:249-258 — <https://pubmed.ncbi.nlm.nih.gov/16571087/>

Review sign-off

Tick one box per line. “Approved with changes noted” — write the change next to the line or attach a note.

Item	Approved	Approved, changes noted	Not approved
Metabolic engine — energy (RMR, activity multipliers, deficit/surplus caps, safety floors)	X	☐	☐
Metabolic engine — macros (protein basis incl. adjusted weight, fat range, carbohydrate remainder, guards)	X	☐	☐
Metabolic engine — micro and meals (fibre, fluid, meal count, per-meal protein threshold)	☐	X	☐
Metabolic engine — caveats shown to the user (read on page 4)	X	☐	☐
Levothyroxine timing — all 21 intervals, merge rule and evidence labels	X	☐	☐
Hashimoto's content spot-checks	X	☐	☐
Benchmark methodology page (accuracy disclosure)	☐	☐	☐
Permission to be named, credentials as written below, on the items I approved	X	☐	☐

Reviewer details (used only on the items approved above)

Field	
Full name	Cayla Bousaba
Credentials as you write them (e.g. RD, RDN, MSc RD)	RDN, LDN
Registration body and number	CDR 86087622
Country of practice	USA
One sentence on your specialism	Gut health, auto immune disorders, and weight maintenance.

"I have reviewed the logic listed above and approve it as shown, subject to any changes noted."

Signature:  **Date:**10/7/2026

Thank you — a named, credentialed review is the single thing this site cannot produce without you.