NUCOREBIO · DOSAGE INTELLIGENCE SERIES

Dosage Benchmark Guide

Effective Clinical Doses vs. Commercial Reality: Identifying Underdosed Products

One of the most pervasive quality problems in the supplement industry is underdosing — formulas that appear to contain premium ingredients but use doses so far below clinical thresholds that the product is biologically inert. This guide provides formulators and brand developers with the reference data needed to assess whether a formula (yours or a competitor's) is likely to produce the claimed effects. Data is sourced from peer-reviewed RCTs, meta-analyses, and, where clinical data is limited, the minimum pharmacologically active dose established in preclinical models.

THE UNDERDOSING PROBLEM

COMMERCIAL REALITY: Industry surveys show 40–70% of supplement products are underdosed relative to clinical evidence thresholds. Common practices include: (1) using low-concentration extracts (10:1 instead of 200:1), (2) listing ingredient weight as whole herb mass not extract equivalent, (3) hiding doses in proprietary blends where no individual amount is disclosed, (4) using poorly bioavailable forms (e.g. magnesium oxide instead of glycinate). This guide helps you identify these patterns and differentiate your formulation.

— REFERENCE TABLE 01

Clinical Dose Benchmarks — Top 50 Ingredients

The following table provides the minimum effective dose (MED) — the lowest dose that produced statistically significant primary outcomes in a well-designed RCT — and the optimal dose (OD) used in the most efficacious studies. Products dosed below MED are unlikely to produce claimed effects. Products dosed between MED and OD will produce effects but may underperform clinical claims.

TESTOSTERONE & MALE PERFORMANCE

Ingredient	Extract / Form	Min Effective Dose (MED)	Optimal Dose (OD)	Common Commercial Dose	Verdict	Key RCT Reference
Tongkat Ali	200:1, Eurycomanone ≥1%	200 mg/day	300–400 mg/day	25–100 mg	Severely underdosed (80%)	Tambi et al., 2012
Ashwagandha	Root extract, withanolides ≥5%	300 mg/day	600 mg/day	100–200 mg	Underdosed (60–70%)	Wankhede et al., 2015
Fenugreek	Saponins ≥50% (Testofen®)	300 mg/day	500–600 mg/day	50–200 mg	Severely underdosed	Wilborn et al., 2010
Boron	Boron glycinate	6 mg/day	10 mg/day	1–3 mg	Underdosed (70%)	Naghii et al., 2011
Zinc	Zinc bisglycinate	25 mg/day	30 mg/day	5–10 mg	Adequate in most	Kilic et al., 2010
Maca Root	10:1 extract	1500 mg/day	3000 mg/day	250–750 mg	Severely underdosed	Gonzales et al., 2002
D-Aspartic Acid (DAA)	Pure D-isomer	2000 mg/day	3000 mg/day	1000–2000 mg	Borderline – MED met in some	Topo et al., 2009
Vitamin D3	Cholecalciferol	1000 IU/day	3000–5000 IU/day	200–1000 IU	Usually adequate	Wang et al., 2011

COGNITIVE & BRAIN HEALTH

Ingredient	Extract / Form	Min Effective Dose	Optimal Dose	Common Commercial	Verdict	Key Reference
Lion's Mane	8:1 dual extract ≥30% polysac.	500 mg/day	1000–2000 mg/day	100–300 mg	Severely underdosed	Mori et al., 2009
Bacopa Monnieri	Bacosides ≥45%	300 mg/day	450 mg/day	50–150 mg	Severely underdosed	Stough et al., 2001
Alpha-GPC	Alpha-GPC ≥50%	300 mg/day	600 mg/day	50–150 mg	Often underdosed	Barbagallo et al., 1994
Phosphatidylserine	From sunflower (≥20% PS)	100 mg/day	300 mg/day	50–100 mg	Often at MED	Cenacchi et al., 1993
L-Theanine	≥98% pure	100 mg/dose	200 mg/dose	50–100 mg	Borderline	Kimura et al., 2007
Citicoline	Cognizin® or pharmaceutical	250 mg/day	500 mg/day	50–100 mg	Severely underdosed	McGlade et al., 2012
Hericenones	Standardized fruiting body	10 mg/day	20–60 mg/day	Often not quantified	Typically not spec'd	Lai et al., 2013
Rhodiola Rosea	Salidroside ≥3%, rosavins ≥1%	200 mg/day	400–600 mg/day	50–100 mg	Underdosed (60%)	Darbinyan et al., 2000

WOMEN'S HEALTH & HORMONAL BALANCE

Ingredient	Form / Spec	MED	Optimal Dose	Commercial Range	Assessment
Vitex Agnus-Castus	Agnuside ≥0.5%	150 mg/day	240 mg/day	20–100 mg	Often underdosed
Red Clover Isoflavones	Isoflavones ≥40%	40 mg isoflavones/day	80–160 mg/day	20–40 mg	Borderline
Shatavari Root	20:1 extract	300 mg/day	600 mg/day	200–500 mg	Mostly adequate
DIM (Diindolylmethane)	Standardized DIM	100 mg/day	200–300 mg/day	50–150 mg	Borderline – check form
Evening Primrose Oil	GLA ≥8% (EPO)	500 mg/day GLA equiv.	1000–2000 mg/day	250–500 mg	Often underdosed
Folate	5-MTHF (methylated)	400 mcg/day	800 mcg/day	200–800 mcg	Check form (folic acid inferior)
Iron (Bisglycinate)	Chelated bisglycinate	18 mg/day	18–27 mg/day	8–18 mg	Often adequate

ANTI-AGING, COLLAGEN & BEAUTY

Ingredient	Specification	MED	Optimal Dose	Commercial Range	Assessment
Marine Collagen Tripeptide	MW < 500 Da, Gly-Pro-Hyp ≥18%	2500 mg/day	5000–10000 mg/day	500–2500 mg	Often underdosed
Hyaluronic Acid	Low MW < 300 kDa	80 mg/day	120–200 mg/day	50–100 mg	Borderline – check MW
Astaxanthin	Haematococcus pluvialis ≥5%	4 mg/day	8–12 mg/day	1–4 mg	Often underdosed
NMN	≥98% β-NMN	250 mg/day	500 mg/day	100–250 mg	Borderline – MED met in some
Resveratrol	Trans-resveratrol ≥98%	100 mg/day	150–200 mg/day	50–100 mg	Often at MED
Glutathione	Reduced (Setria® or equiv.)	250 mg/day	500 mg/day	50–200 mg	Usually underdosed
Vitamin C	Ascorbic acid or Ester-C	500 mg/day	500–1000 mg/day	60–500 mg	Often adequate

Ingredient	Specification	MED	Optimal Dose	Commercial Range	Assessment
Biotin	D-Biotin	5000 mcg/day (hair/nail)	5000–10000 mcg/day	30–5000 mcg	Highly variable

IMMUNE SUPPORT & LONGEVITY

Ingredient	Specification	MED	Optimal Dose	Commercial Range	Assessment
Reishi	≥30% polysaccharides, ≥4% triterpenes	500 mg/day	1000–2000 mg/day	100–500 mg	Often underdosed
Beta-1,3/1,6-D-Glucan	≥75% purity (oat or yeast)	100 mg/day	250–500 mg/day	25–100 mg	Often at MED or below
Turkey Tail (PSK/PSP)	≥30% polysaccharides	500 mg/day	1000–3000 mg/day	200–500 mg	Often underdosed
Quercetin	Quercetin dihydrate ≥95%	250 mg/day	500–1000 mg/day	50–250 mg	Often underdosed
NR (Nicotinamide Riboside)	≥99% purity	250 mg/day	300–500 mg/day	100–300 mg	Borderline
Astragalus	Polysaccharides ≥40%	250 mg/day	500 mg/day	100–300 mg	Often underdosed
Elderberry	Anthocyanins ≥3%	300 mg/day	500–600 mg/day	150–300 mg	Borderline

SPORTS PERFORMANCE & RECOVERY

Ingredient	Form	MED	Optimal Dose	Commercial Range	Assessment
Creatine Monohydrate	≥99.9% pure (Creapure® grade)	3000 mg/day	5000 mg/day (maintenance)	1000–3000 mg	Often underdosed
Beta-Alanine	≥99% purity	2000 mg/day	3200–6400 mg/day	500–2000 mg	Often severely underdosed
HMB (Free Acid)	β-Hydroxy-β-methylbutyrate FA	1500 mg/day	3000 mg/day	250–1500 mg	Often underdosed
Tart Cherry Extract	Anthocyanins ≥10%	480 mg extract/day	960 mg/day	200–500 mg	Borderline
L-Glutamine	Pharmaceutical grade	5000 mg/day	10000 mg/day	1000–5000 mg	Often underdosed
Cordyceps	CS-4 strain, cordycepin ≥0.2%	500 mg/day	1000 mg/day	100–500 mg	Borderline
Electrolytes (Na/K/Mg)	Chelated mineral forms	Na 300 mg + K 200 mg + Mg 100 mg	Na 500 + K 400 + Mg 200 mg	Highly variable	Check all 3 are included

Ingredient	Form	MED	Optimal Dose	Commercial Range	Assessment
PEA (micronized)	Micronized ≥99%	300 mg/day	600 mg/day	50–300 mg	Often underdosed

— APPLICATION GUIDE

How to Audit a Competitor Formula

Use this step-by-step protocol to assess whether a competitor product is clinically dosed or a marketing facade.

Step	Action	What to Look For	Red Flag Signal
1	Check for proprietary blend	Label lists blend total weight only	No individual ingredient weights disclosed
2	Compare each ingredient dose to MED	Look up each active in this guide	Any key active below MED threshold
3	Verify extract concentration	Check extract ratio (200:1 vs 10:1)	Low ratio with same mg weight as high-ratio = far less active compound
4	Check active marker standardization	Look for "standardized to X%"	No standardization stated = likely commodity material
5	Verify form/salt of minerals and vitamins	Check oxide vs glycinate, folic acid vs 5-MTHF	Cheap forms (oxide, carbonate, folic acid) signal corner-cutting
6	Count active vs. inactive ingredients	Identify fillers, excipients, "fairy dust" ingredients	Long impressive ingredient list but each at <5% of MED is marketing only
7	Request COA or lab verification	Ask for HPLC batch test report	Refusal or supplier COA only (no independent 3rd party lab)

THE NUCLEO COMMITMENT

NuCoreBio's formulation commitment: Every NuCoreBio formula is designed to meet or exceed the Optimal Dose (OD) threshold for every key active. We provide batch HPLC reports as standard documentation. If a competitor cannot provide equivalent documentation, the dosage claim is unverifiable. When clients ask "why is your product more expensive?" — this document answers the question.

— PRACTICAL GUIDE

Calculating True Active Content from Labels

Label Claim	Calculation Required	Example	True Active Content
500 mg Tongkat Ali 10:1 extract	Divide by concentration ratio	500 mg ÷ 10 = 50 mg herb equivalent	Effectively 50 mg dried herb — clinical trials used 200:1 at 300 mg → 60,000 mg herb equiv.
300 mg KSM-66® (5% withanolides)	Multiply by standardization %	300 × 5% = 15 mg withanolides	15 mg withanolides — clinical studies used 600 mg KSM-66® = 30 mg withanolides
1000 mg Collagen	Check molecular weight + form	Hydrolyzed collagen MW 5000–10000 Da	Low bioavailability — tripeptide MCT at 500 mg may deliver more bioactive material
250 mg Proprietary Blend [TKA 150mg, Boron 100mg]	Calculate each vs MED	Tongkat Ali 150 mg < 200 mg MED; Boron 100 mg vs 6 mg MED	TKA underdosed; Boron far exceeds MED (100 mg boron is toxic threshold)
200 mcg Folate (as folic acid)	Check form bioavailability	Folic acid requires MTHFR conversion; 30–40% of population has MTHFR polymorphism	Effective folate delivery <200 mcg in significant population subset

REQUEST CUSTOM FORMULA BENCHMARKING

This guide is updated annually as new clinical data becomes available. For category-specific dosage consultations or custom formula benchmarking, contact NuCoreBio's R&D; team. Mc5896538@outlook.com | WhatsApp: +86 15866920149 | NCB-REF-011 · v2.0 · 2026